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INTERNATIONAL ABSTRACT OF SURGERY

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COLLECTIVE REVIEW

PLASTIC AND RECONSTRUCTION SURGERY OF THE FACE

By ROBERT H. IVY, M.D., F.A.C.S., Philadelphia

RECENT progress in the repair of deformities of the hard and soft tissues of the face is due largely to experience gained from the treatment of mutilations of these parts acquired during the World War. The immense amount of clinical material provided opportunities for the thorough testing of already established methods and standardized the application of definite procedures to particular classes of cases. In addition, certain important modifications and improvements over old methods were worked out. Since the war, the benefit of this experience is being reflected in the treatment of facial deformities occurring in civilian life. In a previous review (22), the writer covered the available literature on war injuries of the face and jaws, giving an extensive bibliography. In the present article attention will be called to some of the most important recent advances.

CONGENITAL DEFORMITIES

In the last few years several valuable contributions have been made on harelip and cleft palate. The recent outstanding papers on this subject are those by J. E. Thompson, and V. Veau and his collaborators. Thompson (38) states that the principles of treatment of cleft palate are founded on accurate knowledge of the anatomy of the deformity; in other words, on a correct estimate of the degree of distortion. In regard to complete unilateral cleft palate and harelip, he concludes:

1. If embryonic union fails, the resulting deformity seen at birth can be accounted for in every detail by the muscular action of the tongue.

2. There is little or no separation from one another of the posterior ends of the maxillæ, and any movement here is in the nature of a hinge movement by which the posterior end of the maxilla and the vertical plate of the palate bone swing on their attachments to the pterygoid processes of the sphenoid.

3. The side to which the premaxilla and the septum are attached (the larger side) is more affected by the tongue thrust than the other maxilla, the result being that its anterior end swings outward and forward, taking with it the septum and nose and carrying the alveolar border to a plane far outside and in front of its normal position, and further, the attachment of the septum to the palatal plate has enabled it to withstand the vertical thrust of the tongue and to retain a reasonably good horizontal position.

4. The other maxilla (the smaller side) is displaced as a whole very slightly in a lateral direction, but its horizontal palatal plate is seriously deformed, being frequently thrust upward into a vertical position against the turbinate bone.

Thompson employs the usual Langenbeck lateral incisions, and achieves approximation of the two sides of the soft palate without tension by dividing the levator palati and palatopharyngeus muscles from the nasal aspect. The paper sets forth very clearly the author's rules for undertaking repair in two, three, or four stages.

During 1921 and 1922, Victor Veau, of Paris, was responsible for a series of remarkable papers dealing with harelip and cleft palate. For unilateral harelip (43, 46) he employs Jalaguier's modification of the Mirault operation, a method

which has not the wide recognition it merits and produces far better results than the usual curved or angular freshening of each edge of the cleft. Veau and Lascombe (50, 44) also have valuable papers on the operative treatment of double harelip. In his work on cleft palate Veau (42, 45) begins with a critical review of eighty-nine cases operated on by the classical Langenbeck-Trélat procedure and shows that this method does not yield the uniformly good anatomical results and more particularly the good functional results to be expected of a satisfactory method. The outcome in the eighty-nine cases was as follows:

Single operation:
Complete closure, 48 per cent
Partial union, 33 per cent
Complete failure, 13 per cent

Several operations:
Complete closure, 74 per cent
Partial union, 10 per cent
Complete failure, 2.6 per cent

Effect on speech:
Spontaneous improvement, 25 per cent
Improvement by education, 15 per cent
No improvement, 60 per cent

These rather discouraging results led Veau to investigate the surgical anatomy of cleft palate with a view to discovering if possible the causes of failure and a basis for the introduction of new operative principles. His studies (48) show that in infants with cleft palate there is no failure of development of the muscles of the soft palate, and it is not until later, as the result of disuse, that atrophy occurs. To be useful, a soft palate must be mobile and long. The majority of soft palates that have been operated on are rigid and short. Section of the muscles of the soft palate is the chief cause of immobility. Cicatricial contraction due to the production of a large raw surface on the nasal aspect is the chief cause of shortening. Veau (49) believes he has succeeded, in part at least, in overcoming these two great hindrances to success in the classical operation. In order to approximate the edges of the soft palate cleft without tension he does not resort to section of the levator palati and palatopharyngeus muscles, but, after separating the aponeurosis of the tensor palati from the posterior edge of the hard palate and dividing the tendon of this muscle through a small incision over the hamular process, he holds the two halves of the soft palate together by a horizontal suture wire passed through the muscle substance from side to side. The wire does not perforate the mucous membrane, which would not tolerate it well, but its two ends are twisted and emerge through one of the lateral incisions. The wire never tears in the muscle and perfectly overcomes tension, at the same time permitting movement of the soft palate. Avoidance of a raw surface is more difficult. Instead of incising the nasal mucosa where it is attached to the posterior edge of the hard palate, as is usually done to permit lowering and approximation of the two mucoperiosteal flaps separated from the bone, Veau freely raises the mucosa of the floor of the nose as well as that on the oral side near the edge of the cleft and around the posterior edge of the hard palate, thus obtaining two mucous layers (upper and lower) for closing the cleft. The nasal mucosa is quite elastic and can often be drawn readily across the cleft to be sutured to that of the opposite side. The nasal layer is sutured first and is the most important as it avoids a raw nasal surface with accumulation of infective secretions. Then the oral mucosa is sutured in a separate layer. Complete closure of this layer is not always possible, but this is not so important, as granulations on the oral surface do not cause so much damage as those on the nasal side. Veau's paper, which was read before the Paris Surgical Society, provoked a lively discussion by Jalaguier (23), Broca (5), Ombrédanne (29), and others. Ombrédanne states that rigidity of the soft palate after operation is due partly to infection from the tonsil and partly to an interstitial cicatricial contraction. He finds that spirometric exercises are very useful in preventing rigidity of the palate muscles, and employs them whenever the patient is old enough, commencing about three weeks after the operation.

Ombrédanne (30) corrects deformity of the nostril in harelip cases by removing a small triangular wedge of skin and cartilage from the anterior edge of the nasal opening.

Coughlin (12) reports successful closure of a very wide congenital cleft of the hard palate by means of a pedicled flap of skin from the chest into which a piece of costal cartilage cut to fit the opening had been embedded previously.

Among other noteworthy contributors to the subject of cleft palate and harelip are Davis (13), Kellock (24), Brown (6), and Moorehead (26).

ACQUIRED DEFECTS

The introduction by Gillies (19) of the tubed pedicle made possible the transfer of skin flaps for a greater distance and of larger size, thus putting within the range of surgical repair deformities hitherto regarded as inoperable. Blair (2) achieves the same results by the delayed transfer method. He finds:

1. That the chance of success of a flap is increased, or a longer flap can be raised, or the flap can be cut narrower and thinner with equal chance of success if it is first completely raised and then immediately sutured back into its original bed and the transfer to the new position delayed for a period ranging from six days to two weeks.

2. That if a flap sloughs in its original bed, the extent of the area lost will be considerably less than if it had been immediately transplanted.

3. That if a flap will not survive, it is an advantage to have this fact demonstrated before removal of the scar and freshening of the edges of the defect.

4. That provision for a possible partial loss can usually be made in the planning of the flap.

5. That a blood clot under a flap which has been sutured back into place may be fatal to the flap. The formation of such a clot can be prevented by moderate pressure of the dressings and the use, for twenty-four hours, of multiple drains.

In many cases of very large defects Dufourmentel (15, 16, 17), Sébileau (35), and Moure (27) have made use of very long bands of skin with pedicles at each end assuring adequate vascularization and innervation. For reconstructing the entire upper lip, a complete band of skin is removed from the neck, but left attached at each end, and carried up over the chin and lower lip. This is preferred to taking half of the new lip from the right and half from the left. Later, the mucous surface is supplied by a second bipedicled band of mucous membrane from the lower lip. In other cases the bipedicled skin flap is taken from the scalp, the pedicles being in the temporal region. The hair of the scalp replaces the beard and mustache and hides the operative scars.

FREE SKIN GRAFTS

In reconstruction surgery of the face two types of free skin transplants are employed: the Thiersch-Esser or epidermic graft and the Wolfe or full-thickness graft. Esser, and later Waldron, Pickerill, and Gillies (19), adapted the Thiersch graft for replacing mucous membrane lining cavities (the mouth, nose, eyelids, etc.) with skin, the thin skin shaving being temporarily supported on a mold of dental impression compound. Ferris Smith (36) has utilized this method even for relining the antrum of Highmore after removal of the diseased mucous membrane. The Wolfe graft is particularly useful for covering the secondary defect produced by removal of a pedicled flap; for instance, to replace skin of the forehead which has been employed to reconstruct the nose. The Wolfe graft can be taken from some distant part of the body, such as the abdomen. It should include the full thickness of the skin, but all subcutaneous fat should be carefully removed. Ferris Smith (36) disputes the soundness of the almost universal practice of cutting full-thickness grafts larger than the size of the area to be covered. In his opinion such a graft should be cut exactly to pattern, sutured accurately, and maintained with a light, even pressure. Keller and Parce (31) support their full-thickness grafts by means of dental impression compound, as in the Esser method.

Practically all of the modern principles of surgical reconstruction of the face are exemplified in an article by Blair (3), which is very clearly illustrated by photographs and diagrams. Although this article is devoted to the repair of war injuries, it contains a wealth of material of great value to the plastic surgeon in the correction of deformities seen in civil practice.

ATRESIA OF THE BUCCAL ORIFICE

Atresia of the buccal orifice may be congenital or a sequel of lupus, noma, syphilis, or epithelioma, but most frequently is the result of burns of the face. Rouget (34) observes that if it is marked it may prevent the introduction of solid food, interfere with mastication and speech, and render impossible the insertion of an artificial denture to replace lost teeth. The treatment varies with the nature and extent of the lesion. In minor cases, simple section of a band of scar tissue may suffice. Others are benefited by special stretching apparatus. In pronounced cases with the presence of a considerable amount of scar tissue, operation is indicated. The most favorable results are given by the procedure of Diffenbach or its modification by Ombrédanne. In Diffenbach's operation a small quadrilateral flap is removed from each corner of the constricted mouth opening. This flap is restricted to the skin and subcutaneous tissue, not including the inner mucous membrane, and externally its upper and lower borders almost meet. The amount of cutaneous tissue removed depends on the amount of enlargement desired. After the cutting of the flap the underlying mucous membrane is divided horizontally so as to bisect the denuded area, and at the outer end of this horizontal incision an incision is made perpendicular to the first but slightly convex medially. These incisions form three small mucous flaps, an upper, a lower, and an external flap. The upper and lower flaps are sutured to the corresponding skin margins and the external flap is brought out to form the commissure. When mucous membrane is not available for the com-

missure Ombrédanne modifies this procedure by leaving the skin flap attached at its outer end and folding it into the mouth to cover the previously freshened raw inner surface of the cheek. Grether (20) reports that Avanzi of Verona has devised another simple method of restoring the normal width of the mouth opening. After the proper position for the new commissure has been determined very exactly a puncture is made through the skin, muscles, and mucous membrane at this point, and through the small opening a collar button is introduced which is allowed to remain for several days until the wound has healed around it. The cicatrix thus formed strikingly resembles the normal labial commissure. At a second operation the tissue between the mouth opening and the new commissure is divided and the raw surfaces are covered by suturing the mucous membrane to the skin.

ACQUIRED DEFECTS OF THE PALATE

Small openings in the palate can be closed with local mucous membrane flaps as in cases of congenital clefts. Several writers describe the closure of acquired defects of the hard palate by transplanting pedicled skin flaps. Blair (2, 3) has utilized skin from the neck for both acquired defects and congenital clefts when tissue from the immediate neighborhood was not available. The flap of skin with its pedicle at the lower border of the jaw is raised and immediately sutured back in its bed for delayed transfer to the previously freshened edges of the palate defect. The flap enters the mouth through an opening in the lower buccal fornix, passing between the upper and lower teeth which must be kept separated by some form of splint or block to prevent them from biting into the flap. If some of the teeth are absent, there may be sufficient space to admit the flap without blocking the teeth apart. After the establishment of circulation between the palate and the flap, the pedicle is severed and returned to the neck. Attention has already been called to Coughlin's transfer to the palate of such a flap with costal cartilage. Biedermann (1), instead of employing skin from the neck to close a large palatal defect, introduces through a 4-centimeter horizontal incision in the cheek a pedicled flap from the forehead with its base at the temporal artery.

CORRECTION OF PTOSIS OF THE CHEEK FOLLOWING TRAUMATIC INJURY OF THE PERIPHERAL BRANCHES OF THE FACIAL NERVE

It is recognized that in many of these cases functional restoration of the nerve branches is not possible. Therefore, Morestin, Dieulafé, and others, for the cosmetic effect only, have performed various plastic procedures to raise the sagging angle of the mouth and tissues of the cheek mechanically. Ombrédanne (28) advises supporting the angle of the mouth by means of a small detachable hook extending from metallic bands on the posterior upper teeth. While this appliance is worn, it considerably improves the facial appearance. Perhaps the most satisfactory results are obtained by the operation of Burian (8). Under local anæsthesia an incision is made from the lower border of the malar bone to the lower border of the mandible parallel to and one finger's breadth in front of the masseter. The skin is separated from the muscular layer forward as far as the labial commissure and upward as far as the malar bone. The anterior border of the masseter is exposed and a ribbon of this muscle 1 centimeter wide is detached with its pedicle above. At the lower end a small piece of periosteum is detached with the muscle to serve as support for sutures. The length of the muscle strip should be such that it will remain well stretched when it is placed in its new position. A piece of fascia lata 1 centimeter wide and 7 centimeters long is removed. One end of this is fixed in the wound 1 centimeter below the angle of the mouth by a silver wire passed through the skin, and also to the labial commissure. The free end of the strip of fascia is stretched upward by an assistant while the masseter muscle band is drawn toward the labial commissure, having been divided into two parts. Each part is then sutured very solidly to the orbicularis muscle of the upper and lower lips respectively and to the band of fascia. The position of the angle of the mouth being controlled by drawing on the band of fascia, the end of the latter is sutured very carefully to the periosteum of the anterior surface of the malar bone. The skin wound is then closed.

RHINOPLASTY

Blair (4) is of the opinion that in reconstruction of the nose, unless the result can be made both functionally and cosmetically acceptable, it is better to give the patient a prosthesis. The two chief advances in rhinoplasty during the war were the universal recognition of the fact that the lining is as essential as the external covering, and the very much less general recognition of the fact that the reconstructed parts should be cut from carefully made patterns. Total rhinoplasty may be divided into three essential parts—the providing of the covering, the lining, and the supporting frame. Upon the extent of the nasal deformity

depends the necessity for supplying any or all of these three. Most writers now agree that skin from the forehead (Indian method) is greatly superior to that from the arm (Italian method) to supply the covering of the nose. According to Smith (36), the Italian method, which consists in fashioning a pedicle on the arm and transferring it later to the nose with the arm immobilized on the head until the new blood supply is established, has nothing to recommend it for facial repair and much to condemn it. The position is torture to the patient, there is danger of emboli in the superficial veins of the arm, infection readily occurs from contact with the nose, and dressings are difficult. The supporters of the method can claim only that it prevents scarring of the forehead. This is offset by the fact that the texture of the skin is such that its contrast with that of the face and scalp is very marked. If forehead skin is not available, chest skin should be supplied by the use of Gillies' tubed pedicle. Blair (4) also states that the most dependable tissue for covering the nose and one which can be used also for lining is the skin and subcutaneous tissue of the forehead. The forehead defect can be immediately filled in with a full-thickness skin graft from the abdomen, and when this is carefully done, the repair will be only slightly noticeable. The arm skin transplanted by the Italian method, and skin from the chest or the abdomen transplanted by a "jump flap" do not conform as well in appearance to the normal nasal skin. Small or even quite large flaps can be made from the cheeks, but with less accuracy than from the forehead and the defect is more noticeable; a columella, however, can be made quite well from the upper lip. For replacing lost mucous membrane Gillies (19) suggested covering the under-surface of the forehead flap with a Thiersch graft supported on dental impression compound. Blair (4) finds that such grafts subsequently undergo contraction so great as to demand relining of the nose. He and most other workers rely for this purpose on pedicled flaps of skin from the edges of the defect or the forehead.

There is considerable divergence of opinion as to the best material for the supporting framework of the nose. A few years ago New advocated the use of celluloid. Tieck (39) employs the middle turbinate removed from the same patient, denuded of its mucous membrane, and subjected to sterilization in normal saline at 143 degrees F. for four minutes. The majority of surgeons employ costal cartilage or rib or a combination of both. Cohen (10) says that cartilage grafts alone never form union with bone and are therefore never firmly fixed on the nose and are always absorbed to a greater or less degree. Bone grafts from the anterior border of the tibia have also failed in several of Cohen's cases. He finds the ideal substance in this work to be a graft composed partly of bone and partly of cartilage, taken from the seventh or eighth rib. The bony part of the graft is placed above in contact with the frontal and nasal bones, while the cartilage builds out the lower portion of the bridge. Carter (9) also uses a section of the eighth or ninth rib and costal cartilage, preserving the periosteum on the outer surface. He shows cases of union of the rib and frontal bone several years after operation. That cartilage is absorbed in the tissues is contrary to the observations of Gillies (19), Blair (4), and Smith (36). Blair says: "The general observation is that transplanted bone without normal function does not survive, and in at least two cases of rib transplant for rhinoplasty that have come under my observation two years later the bone has been completely or almost completely absorbed. On the other hand, my observation is that where perichondrium remains in contact with two-thirds of its circumference, the cartilage will persist. We have one case in which the transplanted cartilage has remained unchanged fourteen years." In this connection Smith (36) states: "Free plants of bone with or without periosteum into the soft tissues are slowly absorbed. Cartilage has no blood vessels and lives easily by lymph absorption with or without its perichondrium. It probably grows when its perichondrium remains attached. Cartilage is readily modeled to meet any requirements. Cartilage does not unite with bone, but is held in position by fibrous adhesions. It is the ideal supporting substance." The writer of this review agrees with Gillies, Blair, and Smith as to the superiority and permanency of costal cartilage as compared with other supporting substances in rhinoplasty.

BONE GRAFTS

Delagenière, the originator of the osteoperiosteal graft, gives a comprehensive account of the advantages, indications, and technique in a recent article (14). He states that the object of the osteoperiosteal graft is to furnish all the elements necessary for bone formation to any part of the osseous system where these elements are deficient or completely absent. Properly speaking, therefore, it is not a question of a bone graft, but only a graft of the elements indispensable for the formation of a part of a bone or of an entire bone. Thus, in spite of Albee's statements to the contrary, any part of the skeleton can be recon-

structed and any pseudarthrosis can be cured by means of osteoperiosteal grafts, and these results obtained in a manner more simple, more efficacious, and more certain than with the grafts of Albee. To be sure, the latter may have a useful rôle in certain losses of substance of the tibia, but they rarely succeed when employed alone, and should generally be completed by osteoperiosteal grafts. Delagenière gives in detail the technique of removing the grafts and their application to various situations, among which are the mandible and the nose. Another favored source from which to obtain a bone graft for the mandible is the crest of the ilium, as set forth in the articles of West (51) and Risdon (33). The use of the pedicled graft from the mandible itself is advocated in papers by Cole (11) and Tainter (37). Ivy (21) has collected statistics covering the various methods of bone grafting employed in ununited fractures of the mandible occurring in American soldiers. The article briefly outlines the technique of these methods.

Very complete accounts of the management of maxillofacial injuries in the German army are given in a series of pamphlets by Bruhn, Lindemann, and their collaborators (7), and also in an article by Praeger (32). The underlying principles for the treatment of fractures of the jaws were essentially the same as those recognized by the Allies, namely, the co-operation of the surgeon and dentist and the re-establishment as far as possible of the normal occlusion of the teeth. In splinting, the Germans show a more pronounced leaning toward the employment of orthodontic apparatus and methods. They were particularly successful in the use of the nail extension for the reduction and retention of edentulous jaw fragments. The nail is passed through the fragment by an external incision, force being brought to bear on the fragment by elastic traction on the projecting end of the nail from a wire attached to a skull cap. In bone grafting for ununited fractures with loss of substance the graft was generally obtained from the crest of the ilium.

RECURRENT DISLOCATION OF THE MANDIBLE

Though recurrent dislocation of the mandible is not strictly within the scope of reconstruction surgery of the face, attention is here called to what appears to be a very satisfactory operative procedure for the cure of this obstinate condition. Konjetzny (25) opens the mandibular joint by reflecting a small flap downward. The meniscus is severed from its posterior and lateral attachments but still remains fast in front to the lateral and medial portion of the joint capsule. After severance of the insertion of the external pterygoid muscle from the neck of the condyle, the meniscus is rotated at right angles and sutured in front of the condyle. This corrects the tendency to dislocation by preventing forward movement of the condyle when the mouth is opened. After the operation the jaw is bandaged for ten to fourteen days.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Abadie and Argaud: Crushing Operations in Gastro-Intestinal Surgery; Experimental Research (L'écrasement en chirurgie gastro-intestinale: recherches expérimentales). *Bull. Acad. de méd.*, Par., 1922, lxxxvii, 612.

In experiments on dogs the authors found that, far from causing necrobiosis, crushing methods seem to stimulate multiplication of cells so that the denuded parts are covered more quickly than when simple suture is used.

The objection that the dead tissue produced disturbs cicatrization was not supported by the investigations. Neither was it found that the procedure favored infection.

The experimental work comprised: (1) suture of the sectioned stomach without crushing; (2) suture of the stomach over the Mayo crusher; (3) Mayo crushing of the duodenum with omental plastics; (4) experiments with the Martel crusher; and (5) crushing of the intestine with ligation and a buried pursestring suture.

When crushing was done, consolidation resulted at the end of five days with the exception of healing of the mucosa; the mucosa was healed in twelve days. Chromic catgut alone was used for suturing. Ligation of the intestine over the crushed part followed by the insertion of a pursestring buried suture has no more value than the ordinary suture row which causes a less voluminous longitudinal scar toward the intestinal lumen.

In the authors' opinion the Martel technique gives more uniform and quicker results than the Mayo technique of suturing over the crusher. If the Mayo method is employed a superficial row of sutures should be placed over the crushed part before the buried row.

W. A. BRENNAN.

ANÆSTHESIA

Levine, E. C., and Segall, H. N.: Post-Transfusion Reactions; Alterations in the Blood After Ether Anæsthesia and After Blood Transfusion. *Surg., Gynec. & Obst.*, 1922, xxxv, 311.

In spite of pretransfusion tests to determine the compatibility of the donor's and recipient's bloods, post-transfusion reactions continue to occur.

The authors report three cases which show that a long operation under ether anæsthesia alters the hæmo-agglutinin properties of the patient's serum. In such cases the blood serum withdrawn immediately after the operation had a pinkish tinge and agglutinated the donor's corpuscles. This change disappeared during the first twenty-four hours after the operation, at about the time of the patient's recovery from the effects of the ether anæsthesia. The authors attribute it to:

1. Lipoids liberated from the tissues and taken up by the blood. When the lipoids are excreted from the blood, the serum behaves as before operation.

2. The organic products of surgical shock which may temporarily alter the hæmo-agglutinins.

3. The ether present in the blood. This hypothesis is supported by the pinkish tinge in the serum due to hæmolysis of the red blood cells which is probably caused by the ether. Ortel suggests that ether as a lipoid solvent alters the colloidal state of the blood and thus affects the hæmo-agglutinin and hæmolysin phenomena which are also colloidal reactions. Supporting this theory is Bruere's observation that the blood Wassermann reaction is interfered with by substances which change the colloidal state of the blood.

For postoperative transfusion after prolonged anæsthesia the authors believe it is essential to match the patient's serum with the donor's red cells and vice versa after operation, even when they have been matched previously. The sample of blood serum from the patient must not be taken before the end of twenty-four hours. This necessitates postponing the transfusion twenty-four hours. During the interval the patient may be benefited with glucose or saline injections.

In the treatment of various diseases multiple transfusions from a given donor to a given recipient may cause the development in the blood of the latter of specific agglutinins and hæmolysins against the donor's cells which were not present originally. Cases have been known in which a post-transfusion reaction followed a second or subsequent transfusion when the blood had been matched and there had been no reaction following the first transfusion. Blood tests showed an agglutinative or hæmolytic reaction.

It is important to know whether the reaction is associated with any change in the group of the recipient. Stearns, Fortuine, and Ferry concluded from a review of 280 transfusions that subsequent donations of blood by a given donor to a given recipient tend to increase the frequency of reaction in direct proportion to the number of the transfusions, and that repeated transfusions from several donors to a given recipient tend to increase the frequency of reaction in the recipient. Meleney,

Stearns, Fortuine, and Ferry found that donors differed considerably in their tendency to produce reactions.

A post-transfusion reaction suggests anaphylactic shock. The first transfusion induces the hypersusceptibility of the recipient's serum against the donor's cells.

Robertson and Rous state that in cases of repeated transfusion it is necessary to test for auto-agglutination in the recipient's blood. They point out also that serum separated at 37 degrees C. contains more agglutinins than that separated at room temperature, whereas agglutination is more marked at room temperature.

The authors conclude that the compatibility of the recipient's and donor's bloods must be determined prior to every transfusion; that no transfusion should be done within twenty-four hours of prolonged ether anæsthesia even when the donor has been found suitable previous to the induction of anæsthesia; and that it is best to make both the indirect test to determine the group of the donor and recipient and the direct test to corroborate the compatibility of the bloods. WALTER C. BURKET, M.D.

SURGERY OF THE HEAD AND NECK

HEAD

Walker, F. I.: The Surgical Anatomy of the Superior Sagittal Sinus (Zur chirurgischen Anatomie des Sinus sagittalis superior). *Neuy Chir. Arch.*, 1922, i, 612.

Three venous sinuses of the dura mater are of surgical importance: the sagittal, cavernous, and transverse sinuses. The sagittal sinus, which is located in the falciform process, has been studied the least. This sinus is generally triangular and receives the upper cerebral veins, the veins of the dura and the cranial bones. The conditions found are not always as they are described in textbooks on anatomy.

In rare cases the sagittal sinus is entirely absent (Portal, Veuret). More frequently it is split into two parts by a partition (Knott, Vieg d'Azur, Theile).

The pacchionian granulations of the sagittal sinus have often been studied. The question regarding the pathologic or normal origin of these structures has been answered in many ways, but Trolard (1892) was the first to advance the now generally recognized theory that these structures are normal. The author's own investigations were based on 100 specimens of the sagittal sinus obtained from male and female cadavers of different ages, beginning with early infancy. After the skull had been measured and the vault of the cranium removed the sagittal sinus and its lacunæ were studied and measured.

Regardless of the variations in the findings, two main types of the sagittal sinus were determined: (1) the simple type, with straight outlines and weakly developed lacunæ; and (2) the lacunar type, with markedly winding lacunæ. The lacunæ usually vary in size between 1.1 and 3.3 cm.; in some cases they may measure as much as 6.2 cm. According to their position they may be classified as anterior, middle, and posterior. The smaller the sagittal sinus, the larger were the other sinuses.

The external architecture of the skull and the age of the subject exert an influence upon the structure of the sagittal sinus. The simple straight type is found in dolichocephalic skulls, whereas the winding, lacunar type of sinus is observed more frequently in brachycephalic skulls. At senility there is a confluence of the small lacunæ, and the older the person, the more pronounced are the pacchionian granulations.

The anatomical relations described are of clinical importance. Injuries of the sagittal sinus are not so rare as is generally believed. In 1901 Luys described forty-one cases. The author reports a case of sinus injury in the St. Petersburg Obuschoff Hospital on the service of Grekow. The patient was a man 63 years old who was operated upon for a severe injury of the skull. The hæmorrhage from the injured sagittal sinus was arrested by packing.

In general, such injuries in dolichocephalics and young persons are less dangerous than in brachycephalics and older persons. These relationships come up for consideration also in trephining operations on the skull. SCHAACK (Z).

Dandy, W. E.: An Operation for the Total Extirpation of Tumors in the Cerebellopontine Angle: A Preliminary Report. *Bull. Johns Hopkins Hosp.*, 1922, xxxiii, 344.

The most common tumor in the cerebellopontine angle is an encapsulated endothelioma arising from the leptomeninges. This is a benign tumor. Its complete removal results in a permanent cure but the mortality of the operation is high. Therefore partial intracapsular enucleation is to be preferred. The salient features of the author's method are as follows:

Bilateral suboccipital exposure of the cerebellum is effected with as much exposure of the involved angle as possible. The interior of the growth is removed with a curette. The capsule is then picked up with the forceps and, beginning at the upper and lower poles, carefully drawn away from the medulla, pons, and mid-brain. This traction brings into view the several small veins and arteries crossing from the brain stem to the tumor. The vessels are ligated individually with silver clips or fine silk ligatures and divided. Gradually the whole tumor is delivered from its bed without trauma to the brain stem. The cranial nerves stretched by the neoplasm are liberated as the capsule falls away from them. H. A. MCKNIGHT, M.D.

Ranschoff, J. L.: Occipital Encephalocele. *Cincinnati J. M.*, 1922, iii, 289.

The author reports an encephalocele as large as a man's fist in a child six weeks old. The swelling occupied the entire fold between the neck and the scapular region and compelled the child to hold its head to the left side. The sac was thin and translucent, and seemed about ready to burst; an impulse was noted when the child cried. X-ray examination showed a split in the posterior processes of the atlas.

At operation under ether anæsthesia the sac was entirely circumscribed, sufficient skin being left to close the opening. The sac was then dissected to a rather wide pedicle, opened, and found to contain the left lobe of the cerebellum. The cerebellum was returned to the cranial cavity, the dural wound closed, and the bone defect repaired by reflecting two periosteal flaps and suturing one over the other with catgut. The skin wound was closed with fine silk. The postoperative recovery was uneventful.

Fourteen and one-half months later the child seemed normal except for a wry neck (probably due to involvement of the cervical nerves), inability to sit up, and poor development.

WALTER C. BURKLE, M.D.

Adson, A. W.: Preservation of the Motor Root of the Gasserian Ganglion During the Division of the Sensory Root for Trifacial Neuralgia. *Surg., Gynec. & Obst.*, 1922, xxxv, 372.

The author describes the technique of preserving the motor root while dividing the sensory root of the gasserian ganglion which was done in the Mayo Clinic in nine consecutive cases since March, 1922. The disadvantages of a radical operation, such as hæmorrhage, ocular palsy, a high mortality rate, traumatic keratitis, and occasional facial paralysis, have been largely overcome by refinement of technique and the use of special instruments. Numbness of the face and the margin of the tongue is still a disadvantage which cannot be overcome, but the patient who has had one or two recurrences of true trifacial neuralgia readily accepts the numbness in exchange for the excruciating pain incident to the disease.

When the motor root is sacrificed, paralysis of the pterygoids, masseter, and temporal muscles disturbs the alinement of the jaw when the mouth is opened, prevents good coaptation of the teeth on the side operated upon, and causes atrophy of the muscles and depressions above and below the zygoma. With the technique described it is possible to preserve the motor root without the use of the faradic current, thereby preventing motor paralysis, but in very old persons who have had their teeth removed and do not intend to use a plate there is no object in preserving it.

It is possible to dissect the sensory root from the motor root and divide it without injury to the motor root in approximately the time required to divide the sensory and motor root of the gasserian ganglion. The motor root, as it enters the middle fossa over the petrous portion of the temporal bone through the hiatus in the dura, is found underneath the sensory root on the mesial side; it continues in that relation under the root fibers until it approaches the gasserian ganglion body, when it makes a fairly abrupt turn and passes obliquely downward and outward underneath the gasserian ganglion through a separate sheath of the third branch into which it diffuses.

The ganglion is exposed through an oblique incision of the skin, temporal fascia, and temporal muscle made 1 cm. in front of the ear and extending upward and backward from the zygoma for 7 cm. A trephine opening about 3 cm. in diameter is then made in the skull, the dura elevated, the middle meningeal artery ligated, the third branch of the nerve identified, and the dissection carried upward and backward, the dura being elevated from the arachnoid which is attached to the ganglion until pulsation can be seen above the ganglion. The arachnoid covering the posterior root fibers is then opened with a small, sharp, right-angled knife, all sensory root fibers and the outer part of the gasserian ganglion being well exposed. After bleeding has been controlled the assistant holds the illuminated retractor, gently elevating the temporal lobe, holding the dura taut, and exposing the posterior margin of the gasserian ganglion along with the sensory root.

The small dissecting hook is then placed over the sensory root fibers on the mesial side as they enter the ganglion and these fibers are retracted gently in a downward and forward direction, the posterior sensory root fibers and the posterior margin of the gasserian ganglion on the mesial side being slightly elevated. With another hook the mesial side of the sensory root is caught and elevated by traction downward and outward sufficient to expose the motor root lying as a separate fasciculus underneath and independent of the sensory root presenting a downward course toward the third branch. This is preferable to following the sensory root fibers upward and inward to the mesial side of the gasserian ganglion. After the motor root is brought into view the sensory root is held away from the motor root by a hook and the sensory fibers are divided with a knife.

Profant, H. J.: Chronic Suppurative Parotitis with Acute Exacerbations. *California State J. M.*, 1922, xx, 301.

With the report of a case in which there were two acute attacks of suppurative parotitis within a year the author gives a brief review of the essentials of the anatomy and physiology of the parotid gland and discusses the etiology and treatment of suppurative parotitis. On the basis of his own case and those reported in the literature he draws the following conclusions:

1. Chronic suppurative parotitis with acute exacerbations is a rare condition.

2. An acute attack is favored by inactivity of the gland.

3. Susceptibility of the gland to infection is favored by stasis.

4. The exciting cause is an acute infection occurring in the chronic condition.

5. The prophylactic treatment is maintenance of active secretion.

6. The active treatment consists in the alternate local applicaton of heat and cold.

7. Whenever the general symptoms warrant, drainage should be established by free incisions.

E. C. Robitshek, M.D.

Edberg, E.: Congenital Labiopalatine Malformations. *Acta chirurg. Scand.*, 1922, lv, 1.

Lip and palate defects occurring alone or with other congenital malformations may be inherited. In Edberg's opinion it is the duty of physicians to enlighten the laity as to the manifest familial propagation of certain malformations.

In 154 labial and eighty-four palatine operations the mortality was 6 per cent. The danger of aspiration pneumonia from narcosis is emphasized and early operation on the lip without anæsthesia recommended to overcome this as well as the inanition due to the infant's inability to nurse satisfactorily. The palate should be left alone until the child is 2 or 3 years of age. The mortality of early palate operations is high, 12 per cent. The author has performed eighty-four palate closures in children ranging in age fom 1 to 8 years. There were two deaths from pneumonia.

In operations upon the lip, flaps from the nasal septum and the lateral aspect of the jaw are utilized to close the nasal opening. As a part of the postoperative treatment the lips are exposed to direct sunlight for a period each day.

In closing the palate the methods of Lane-Moscovic and Langenbeck are used. All operations are done in two stages. Since 1912 the author has operated upon twenty-seven cases with the Lane-Moscovic method. In nineteen, healing occurred by first intention; in three, a fistula formed; in one, there was partial rupture, and in one, total rupture. There was one death in this series.

The influence of palatine operations on speech is discouraging, but the afflux of air to the nasopharyngeal cavity becomes normal and the entrance of food into the nasopharynx is prevented.

Edberg's investigations have brought to light the fact that labiopalatine malformations occur considerably more often in males (57 per cent) than in females (43 per cent). In 2.3 per cent of the cases the condition was inherited from one of the parents and in 3.7 per cent it was present also in a brother or sister. In 5 per cent it was combined with other disabilities or defects. The incidence of the various malformations was as follows: simple labial defect, 25 per cent: simple palatine defect, 25 per cent; and a combination of the two defects, 50 per cent.

A. B. Murphy, M.D.

Ochsner, A. J.: The Treatment of Cancer of the Jaws. *Ann. Surg.*, 1922, lxxvi, 328.

Ochsner's experience has convinced him that early and very extensive operation with the cautery followed by carefully planned after-treatment with the X-ray or radium is quite worth while in cases of cancer of the jaws as occasionally even advanced cases will be permanently cured by this method.

Morris H. Kahn, M.D.

NECK

Tinker, M. B.: The End-Results of Treatment in Certain Forms of Malignancy of the Neck. *Ann. Surg.*, 1922, lxxvi, 345.

In response to a circular letter to all members of the American Surgical Association concerning results in the management of various forms of malignancy of the neck, the author received data from thirty-eight surgeons.

From the standpoint of treatment Tinker divides the cases into three groups: (1) those in which operation is contra-indicated, such as cases of metastases to the neck from tonsillar or pharyngeal growths or growths of unknown origin (the roentgen-ray or radium should be used for these); (2) those in which operation offers a reasonable prospect of cure, such as cases of early malignancy originating in branchial cleft remnants, carotid-gland tumors, parotid tumors, and early cases of Hodgkin's disease; and (3) those in which operation offers little, but the roentgen-ray and radium have caused improvement and occasionally a cure, viz., advanced cases of Hodgkin's disease, thyroid malignancy, and branchial cleft carcinoma.

Permanent results depend upon complete extirpation of all diseased tissue and all neighboring lymphatic glands, block dissection, sharp dissection as opposed to blunt dissection, and the use of the actual cautery instead of the knife for the excision of certain growths. A dry field is obtained by control of the main arterial blood supply early in the operation, either by temporary closure with a Crile clamp or a Halsted and Matas flexible metallic band or by vessel suture. A greater portion of a large vessel can be saved and therefore more collateral circulation can be preserved by vessel suture. The author has sutured the carotid artery three times — twice for carotid-gland tumor and once for branchial cleft malignancy. The patients survived five years or longer. All general anæsthetics increase blood pressure and the venous ooze. The majority of surgeons prefer ether. The author favors local anæsthesia with or without general anæsthesia.

In 183 cases of Hodgkin's disease a five-year cure was obtained in seventeen. Some surgeons have abandoned surgical treatment of this condition. The roentgen ray has caused striking improvement in many cases which appeared to be hopeless.

In twelve cases of carotid-gland tumors there were five five-year cures and one operative death. The

author regards carotid-gland tumors as malignant. Radical removal of the growth with permanent closure of the arteries gives a good prospect of permanent cure. Dissection from the vessels is frequently followed by recurrence.

In sixty-two cases of thyroid-gland malignancy there were fifteen five-year cures and one operative death. The Mayo Clinic has had 207 cases but has not reported the late results. The length of time the disease has remained unrecognized or even unsuspected is often surprising. Operation performed before the tumor has extended beyond the capsule should give a permanent cure. In two cases with extensive malignancy of long standing and with infiltration of the great vessel sheaths and the larynx, thorough removal of the growth followed by radium treatment has given a cure lasting for seven years in one case and for eight years in another.

In fifteen cases of branchial cleft malignancy there were three five-year cures and two operative deaths. The results depend largely upon the duration and the extent of the growth. Early operation gives a reasonable prospect of cure, and certain of the surgically hopeless cases can be cured by the application of radium.

In 170 cases of parotid-gland malignancy there were twenty-two five-year cures. If the growth is within the capsule there is a chance for a permanent cure, and if the capsule is carefully followed during excision the facial nerve may be avoided. The author has operated upon eight cases without injury to the facial nerve and with permanent cure. After the capsule has been broken the growth extends rapidly and the prospect of permanent cure becomes less. The author draws the following conclusions:

1. The end-results in certain cases usually considered mildly malignant are perhaps not so good as is generally supposed.

2. A number of reliable observers have seen permanent improvement follow the use of the roentgen ray and radium.

3. Certain forms of malignancy of the neck considered hopeless by some surgeons have been operated upon with apparently permanent cure by others.

WALTER C. BURKET, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Dunham, E. K.: Infection in the Mediastinum in Fulminating Cases of Empyema. *Surg., Gynec. & Obst.*, 1922, xxxv, 288.

Fulminating cases of empyema are frequently associated with pericarditis or peritonitis. These conditions have often occurred so nearly simultaneously as to suggest that the streptococcus has a special predilection for serous membranes. Statistical data based on about 4,000 cases of non-traumatic empyema tend to show, however, that this assumption is not correct, the involvement of the pericardium, the peritoneum, and the pleura being due to direct extension of the infection through the interstitial tissues.

Since extension from the peribronchial tissue spaces may advance toward the pleura and cause empyema, it is not at all unreasonable to suppose that it can travel also in the opposite direction and thus involve the hilum and the mediastinum. In the histories of 3,889 cases of empyema there was no record showing the recognition of acute mediastinal infection during life but this condition was noted at autopsy in sixty-seven (12.6 per cent) of the 531 necropsies performed within four weeks after the empyema was recognized.

The author discusses the histories and autopsy reports in detail and cites cases which support his conclusions.

Sections of the tissues clearly demonstrated the presence of the infecting organisms in the interstitial spaces. In one case with distinct interstitial involvement the cultures from the heart blood were negative, a fact indicating that the presence of the bacteria in the mediastinal tissues is not due to bacteræmia.

Attention is directed to the fulminating character of the cases in which an infection of the mediastinal tissues is observed most frequently. The incidence of mediastinitis declines rapidly in the successive weekly periods. RALPH B. BETTMAN, M.D.

Sorge: A Contribution to Our Knowledge of Mediastinal Tumors (Beitrag zur Kenntnis der Mediastinaltumoren). *Arch. f. klin. Chir.*, 1922, cxx, 150.

The author reports a case of very large mediastinal tumor in a farmer 23 years of age and discusses the clinical aspect and pathologic anatomy of the condition.

An early diagnosis is rarely made. Most cases come to the clinic with the most pronounced symptoms of compression in the mediastinum. The variations in the condition are always striking: the most severe dyspnœa gives way to complete euphoria following slight therapeutic measures.

In the case reported, salvarsan therapy had a transiently good effect although the Wassermann test was negative. This fact the author attributes to the extensive necrosis which was found at autopsy. He therefore recommends the trial of salvarsan therapy in all such cases. Other treatment is purely symptomatic. The only surgical treatment usually possible when the tumor is situated in the anterior mediastinum is decompression by a Sauerbruch longitudinal mediastinotomy. When the tumor is in the posterior mediastinum an Esderlen right angled flap reaching to the border of the scapula and with its base from the

third to the ninth thoracic vertebra, should be formed to obtain an extrapleural exposure.

The tumor in the author's case was probably a lymphosarcoma originating in the remains of the thymus. SIEVERS (Z).

Hoernicke, E.: A Teratoma of the Anterior Mediastinum (Ein Teratom des vorderen Mediastinums). *Ztschr. f. Path.*, 1922, xxvii, 237.

Among teratomata of the anterior mediastinum those of cystic type are more common than the solid teratomata. All consist of fibrous substance and formations resembling skin. In those of complicated structure the tissue of all organs may appear; sometimes there are also tissues which have undergone malignant degenération. Such tumors are most common between the twentieth and thirtieth years of age. The clinical symptoms correspond in general to their size. The mortality is very high because of the encroachment of the growth on the respiratory and circulatory tracts. Metastases are rare, even in cases of the malignant forms. Seven of the sixty-four known cases are cited and a case treated by the author is reported in detail.

Hoernicke's patient was a man 25 years of age. In the anterior mediastinum was found a cyst the size of a child's fist, with two cavities. Both cavities contained pulpy masses, and in the larger, hair and polypous proliferations from the wall were present in addition. In a thickened portion of the wall were a few more small cysts. The ground substance of the wall was connective tissue and contained smooth muscle fibers, particularly entodermal formations, and transversely striated muscle fibers. The cavities were lined with epithelium of the character of epidermis or mucous membrane epithelium. A few small cysts contained columnar epithelium. On the areas with polypous development the epithelial covering showed sebaceous glands, sweat glands, and undifferentiated glands. Thymus tissue, a small piece of cartilage, and a mass of undifferentiated tissue were also found. KOENIG (Z).

Leavitt, P. H.: Tuberculosis of the Breast, with the Report of Two Cases. *Boston M. & S. J.*, 1922, clxxxvii, 392.

The author gives a brief review of the literature. On the basis of postmortem examinations it is assumed that cases of tuberculosis of the breast show evidence of tuberculosis also in the lungs or the abdomen. The infection enters the breast through the blood or lymph streams, by direct extension, or through a cracked nipple. The general appearance of the discrete and confluent types is described. A discussion of the differential diagnosis and treatment is followed by a report of the author's two cases. The article is summarized as follows:

1. Tuberculosis of the breast is one of the rarest forms of tuberculosis.
2. The source of the infection is variable.
3. A differential diagnosis between carcinoma and tuberculosis is often difficult.
4. Operation gives excellent results. The choice of operation must be based on the type of the infection. E. C. ROBITSHEK, M.D.

Bunts, F. E.: The End-Results of Operations for Cancer of the Breast. *Ann. Surg.*, 1922, lxxvi, 341.

For successful results the treatment of cancer of the breast like that of any other pathologic condition must be strictly individualized.

The results depend more upon the stage and dissemination of the growth when it is presented for treatment than upon the particular type of operation performed.

More data regarding the pre-operative and post-operative use of the X-ray and radium are required before final conclusions can be drawn, but there seems to be little doubt of the value of radium applied directly in the axilla.

The substitution of the X-ray or radium for surgical treatment cannot be safely considered at the present time.

The early removal of the growth remains the one and only sure method of treatment.

H. W. MCKNIGHT.

TRACHEA AND LUNGS

Marschik, H.: Tracheal Resection and Tracheoplasty, with Special Consideration of Transverse Resection (Ueber Trachealresektion und Trachealplastik mit besonderer Berucksichtigung der Querresektion). *Monatsschr. f. Ohren.*, 1921, lv, 776.

Although dilatation is the method of choice in the treatment of cicatricial stenoses, operation may be rendered necessary by such conditions as ulcers due to pressure, difficulty in the introduction of bougies, etc. In cases of stenosis due to softening, the delicate hyaline cartilage of the tracheal passages is easily destroyed by pressure from without (struma) or by perichondritis. A condition designated as "tracheomalacia" then develops which robs the trachea of its firmness. When this occurs the stenosis and the inspiratory suction of the tracheal wall cannot be relieved after the removal of the pressure and the only treatment possible is tracheal resection. Partial resection with covering of the resulting defect by a plastic operation is best. The prognosis of total or transverse resection is less favorable. As the lung, and in fact all of the thoracic viscera, are hung on the trachea, as it were, a great dehiscence develops following the transverse resection, and this can be prevented by suture only with difficulty. The author's method of suturing is as follows:

1. A circular and, if possible, submucous suture is inserted. This may be done posteriorly by turning the tracheal stumps; it may be possible also to suture the posterior circumference with catgut from within, the knots being placed in the lumen

of the trachea. The anterior suture, however, is submucous and of silk, and all the sutures are placed, if possible, without injuring the cartilaginous rings.

2. Several submucous retention sutures and relaxation sutures respectively are placed partly around the next and partly around every second cartilaginous ring without injury to the cartilage.

3. The lateral walls of the trachea are fixed to the sternocleidomastoid muscles according to the method proposed by Bircher. As a result of the application of two such fixation sutures of silk on each side, marked traction outward and, with it, permanent spreading apart of the lateral walls is obtained by compression of the uninjured trachea, and after transverse resection of the trachea the lower stump is held upward in permanent powerful traction.

4. Adhesion of the trachea to the skin in the form of a tracheal stoma is obtained as an additional protection for the circular suture. This prevents the sinking of the tracheal stump, even when the other safeguards are in time divided or resorbed. To make the tracheal stoma, the trachea, which was sutured circularly with great care, is again split vertically for 3 cm., the mucosa is accurately approximated to the skin, and a cannula is inserted. The defect cannot be covered for six months. Simple freshening of the wound and suture is possible only when the defect is very small as the approximation of the edges of the defect contracts the lumen of the trachea transversely.

The author fills the defect with costal cartilage with its perichondrium. In order to make the lumen of the trachea as wide as possible the inner side of the cartilage is hollowed out in the shape of a trough after the perichondrium is cut and reflected. The perichondrium is then laid back in the trough and the cartilage shoved into a pocket under the skin near the edge of the tracheal opening in such a manner that the portion of skin coming into the lumen of the trachea is very thin. When the cartilage has healed into the pocket, the skin flap with its cartilage is separated, reflected inward, and sutured into the defect. The wound remaining on the outer surface is covered at once or later.

PAETZOLD (Z).

Meyer, W.: The Establishment of a Temporary or Permanent Pulmonary Lip-Fistula in the Conservative Treatment of Advanced Bronchiectatic Lung Abscess. *N. York State M. J.*, 1922, xxii, 389.

The author classifies non-specific subacute or chronic lung suppurations into three groups:

1. The ordinary lung abscess which usually follows pneumonia or influenza.

2. The bronchiectatic type, viz., multilocular lung suppuration due usually to the aspiration of a solid foreign body or a benign intrabronchial tumor but not infrequently of congenital origin.

3. The bronchiectatic lung abscess due to the aspiration of septic semi-solid or liquid material or an embolus of small size, and slight infection causing local gangrene.

The three classes require different treatment. A simple method which often cures the active lung disease is the establishment of a pulmonary lip-fistula. After the principal cavity has been emptied of its contents (pus, old fibrinous coagulations, etc.), such a fistula ventilates the cavity and does away quickly and definitely with the foul odor of the sputum. It was observed that incidentally the sputum also ceases after a while. When the patient has recovered and is discharged from the hospital he appears perfectly well. So far, the author has had no opportunity to close the lung fistula. In two of his patients it has closed spontaneously. So long as the canal remains open a cure has not been effected. Extirpation of the affected lobe or lobes is the best and most radical surgical treatment, but is absolutely contra-indicated in the cases of weak and reduced patients.

EMIL C. ROHRSHEK, M.D.

Schlaepfer, K.: Air Embolism Following Various Diagnostic or Therapeutic Procedures in Diseases of the Pleura and the Lung. *Bull. Johns Hopkins Hosp.*, 1922, xxxiii, 321.

Following various diagnostic and therapeutic procedures on the chest — puncture; irrigation of a cavity; the changing of tubes; the introduction of a probe, a rubber catheter, or bismuth paste; decortication; thoracoscopy; fat or paraffin plombage; pneumotomy; pneumectomy — complications may ensue which have been traced experimentally to air emboli.

In neurotic emaciated persons the sudden release of a great amount of fluid may cause a similar clinical picture. Because of its slightness and short duration and because of the absence of localized cerebral symptoms and serious sequelæ, this condition is attributed to shock.

Chronic myocarditis or insufficiency of the adrenals may cause sudden death during the performance of an operation on the chest wall.

A similar clinical picture is seen in embolism of the pulmonary artery. Death following these signs may occur also in a few cases of emboli in the brain following thrombosis of pulmonary veins.

It has been demonstrated by experiments that even in the normal pleura there is no reflex to explain these complications. Accidents in pneumothorax therapy have proved them to be due to air emboli.

The pathologic condition of the lung and the pleural sheaths is the same in all these cases. In a circumscribed area the lung tissue shows a condition which is partly an infiltration, partly an induration. The blood vessels here, especially the veins, are fixed in distension and when mechanically injured in such rigid surroundings cannot collapse as usual, the hole therefore remaining open. The distance of the wounded vein from a branch of a larger pulmonary vein under negative pressure, which can

aspirate the air with the stagnating blood, determines whether air embolism will become evident.

The clinical pictures in cases of air embolism show a wide variety. Further study of these complications should be made by means of examinations of the eye, fæces, and urine.

The best treatment is preventive. When an air embolus occurs the operation should be stopped immediately, the patient's head lowered, and the heart action stimulated. Intravenous injections of adrenalin will increase the amount of blood passing through the brain by decreasing the blood supply in the splanchnic areas. H. A. McKNIGHT, M.D.

HEART AND VASCULAR SYSTEM

Von Albertini, A.: Pulling-Rupture of the Heart and Its Mechanism (Die Zerrungsruptur des Herzens und ihr Mechanismus). *Frankfurt. Ztschr. f. Pathol.*, 1922, xxvii, 385.

A girl threw herself from the third story of a house and died three days later. Death was attributed to fracture of the pelvis with injury to the intestine. Autopsy showed a transverse tear of the endocardium at the base of the right anterior pulmonary valve and hæmorrhages in the epicardium and endocardium at the base of the right auricle. Microscopic examination showed an oblique tear in the lowest segment of the pulmonary tube extending to the cardiac muscle fibers.

There are three varieties of rupture of the heart: those due to bursting, those due to crushing, and those due to pulling. The bursting ruptures are caused by an increase in the internal pressure, traumatic or spontaneous. The tear occurs at the site of the greatest tension of the wall, the highest pressure, and the greatest elasticity. Crushing ruptures are caused by the action of a secondary external force against the region of the heart. The case reported by the author was a pulling rupture due to the heart's continuing to fall when the body struck the ground. The rupture site is characteristic for ruptures of this type. The heart is forced out of its normal position and a tear takes place at the point where the pull is greatest. KLOSE (Z).

Allen, D. S., and Graham, E. A.: Intracardiac Surgery—A New Method: Preliminary Report. *J. Am. M. Ass.*, 1922, lxxix, 1028.

The new surgical procedure for intracardiac operations which the authors have worked out is performed in the following manner:

A cardioscope is introduced into the cavities of the heart through the heart wall and tied into the wall by a pursestring suture or a ligature thrown around the point of introduction which also controls the hæmorrhage. It is then manipulated to bring into view the desired portion of the interior of the atrium or the ventricle. The blood does not obscure the view. The endocardium can be seen through the cardioscope as clearly as the mucosa of the bladder is seen through the cystoscope.

The cardioscope is a metal tube with one end closed by a planoconvex lens. The convex surface of the lens is outside and can be applied snugly to the walls of the heart cavity.

A knife to cut the valves is carried alongside the tube of the cardioscope. The flat steel handle is held close to the tube by two collars. The blade of the knife is placed at right angles to the handle. The cutting edge faces the lens. The entire blade can be concealed in a groove cut across the center of the lens.

Because of hæmorrhage the ventricular route of entry to the mitral valves was chosen at first, an opening just sufficient to admit the cardioscope being made through the wall of the left ventricle near the apex and a pursestring placed about the instrument. Because of high pressure and cardiac disturbances, however, this method was abandoned and the left auricular appendage chosen as the route of approach.

The end of the cardioscope is pushed from the cavity of the left auricle into the cavity of the left atrium, the instrument being held so that the valve leaflets are in contact with the lens during systole. The knife blade is pushed into the cavity of the ventricle. By traction on the handle of the knife the leaflet is then brought against the lens, and by further traction the valve is cut.

The end of the cardioscope is then withdrawn from the cavity of the atrium into the cavity of the appendage. While it is being held there, that portion of the auricular appendage which contains the end of the cardioscope is tied off and amputated.

Twenty-two experiments have been done through this approach. There was only one fatality and this was due to a very easily avoidable fault of technique.

The advantages of the procedure are that hæmorrhage is prevented, the circulation is not interrupted, haste is not imperative, and the operation can be carried out under the guidance of the eye.

H. A. McKNIGHT, M.D.

PHARYNX AND ŒSOPHAGUS

Beck, O.: The Etiology of Retropharyngeal Abscesses (Zur Ætiologie der Retropharyngealabscesse). *Monatsschr. f. Ohrenh.*, 1921, lv, 966.

The rupture of pus through the tip of the inflamed mastoid process into the soft parts of the neck causing a condition known as Bezold's mastoiditis is not uncommon. Cases in which the pus penetrates to other sites are less frequent.

The author describes two cases of the latter type. In one, the rupture occurred in the floor of the tympanic cavity, and in the other in the median wall of the mastoid process. In both, the gravitation of the pus led not only to an abscess visible externally, but also to a retropharyngeal abscess. Beck states that retropharyngeal abscesses originating in the ear always lie in front of the deep fascia of the neck. BEZOLD (Z).

Lotheissen, G.: Plastic Repair of the Œsophagus, Particularly from the Stomach (Ueber plastischen Ersatz der Speiseröhre, insbesondere aus dem Magen). *Beitr. z. klin. Chir.*, 1922, cxxvi, 456.

After a short review of the history of plastic repair of the œsophagus, particularly from the stomach, and a discussion of the indications for this operation, Lotheissen reports his use of the Beck-Jianu-Halpen method in four cases of stricture of the œsophagus due to burns caused by lye. Two of the patients died, one from bronchopneumonia, the other from rupture of the unligated lower œsophageal stump with the symptoms of abscess formation anterior to the cervical column.

The principle of the operation, which is carried out in a number of stages, consists of the formation of a tube from the greater curvature of the stomach which is placed in front of the ruptured wall. Twice the author succeeded in suturing this tube directly to the œsophagus, which was brought forward; in the other two cases, because of the site at which the gastro-epiploic artery entered the stomach, it was necessary to introduce a skin canal between the anteriorly placed tube made from the stomach and the end of the œsophagus.

A fifth case is reported in which the substitute for the œsophagus was taken from the transverse colon. The patient died from pneumonia. In two other cases, in which Lotheissen followed the proposal of Blauel to use the jejunum, one patient died from cardiac weakness, but the other was cured. In an eighth case, he performed the antethoracic operation according to Wuellstein's method. This patient died from mediastinal abscess.

Lotheissen reviews critically the various methods of œsophagoplasty, comparing the results of different surgeons. In conclusion he gives a tabulated review of operations and operative attempts to date, the total number of which, including five attempts at plastic surgery in carcinoma, is 135.

JEHN (Z)

Lilienthal, H.: Carcinoma of the Thoracic Œsophagus. *Ann. Surg.*, 1922, lxxvi, 333.

Lilienthal reports the final notes and the findings at the postmortem examination of a case of cancer of the thoracic œsophagus which had been operated upon and discharged from the hospital apparently entirely cured.

A gradual narrowing of the mucocutaneous border of the upper segment developed and was treated with bougies. Six months later two small elevations above the upper stricture were removed by œsophagoscopy. One was a polyp and the other a carcinoma.

Under general anæsthesia the former operative region was re-opened and the reconstructed cutaneous œsophagus exposed and incised. The inner surface was pinkish-white in color and still showed fine hairs. The lower end had contracted moderately. The upper opening, which admitted only a fine probe, was divided and stretched to the size of the index finger. A small polypoid mass was removed from the mucocutaneous border and a stomach tube passed through the openings into the stomach. One hundred and eighty millicuries of radium filtered through ½ mm. of silver and 1 mm. of rubber were applied just above the upper stricture for three hours. Two weeks later there was some reaction with substernal pain. Another three-hour application of radium was then given. This was followed by a severe reaction with aphonia due to paresis of the left cord which remained permanent. Suspicious areas at the mucocutaneous junction were treated with light applications of the electrocautery through the wound in the back. Regular feedings were given through the wound in the back. Seven days later the patient developed dyspnœa and strangling on attempting to swallow. An instrument could be passed through an aperture into a bronchus. The patient died from pneumonia one year and four months after the first operation.

The postmortem examination revealed a large necrotic fistula between the trachea and the œsophagus about 1 in. above the upper mucocutaneous border. A mass of glands was found behind the œsophagus and another between the œsophagus and the aorta, infiltrating and binding the two together. The skin transplant appeared normal. The line between the skin and mucous membrane was smooth and free from a visible cicatricial break.

The author attributes the fistula to radium necrosis. He concludes that the operation, as planned, is feasible, but a successful result depends upon the localization of the lesion within the œsophagus and a resection of the œsophagus much wider than the visible extent of the lesion.

WALTER C. BURKET, M.D.

Hedblom, C. A.: Combined Transpleural and Transperitoneal Resection of the Thoracic Œsophagus and the Cardia for Carcinoma. *Surg., Gynec. & Obst.*, 1922, xxxv, 284.

Hedblom resected the thoracic œsophagus and the cardia for carcinoma involving both structures. The operation followed preliminary resection of the fifth to eleventh ribs on the left side and was performed under local anæsthesia and gas and oxygen analgesia. The left pleural cavity and the peritoneal cavity were opened widely, the diaphragm was slit down to the hiatus, the œsophageal stump was sutured to the skin edges in the mid-axillary line, and the gastric stump was brought to the surface near the midline. The patient recovered from the operation and was able to swallow liquids and semi-solids through a rubber tube connecting the two stomas.

The patient was a man 52 years of age who first noted dysphagia two and one-half months before admission to the hospital and had lost about 15 lbs. in weight. An obstruction in the œsophagus was localized 43 cm. from the incisors by a bougie and a bismuth roentgenogram. A diagnosis of carcinoma of the lower œsophagus was made.

A preliminary rib resection was performed to facilitate exposure and to collapse the lateral chest wall so that an œsophageal stoma could be made. At the time of the radical operation the growth was localized in the cardia but extended through the hiatus. There were no markedly enlarged glands. The incision was extended upward and the pleural cavity opened widely. The diaphragm was then split radially to the hiatus and the cardiac end of the stomach and the œsophagus were mobilized up to the root of the left lung. The right vagus trunk was separated, the left one cut. During these steps of the operation there was no appreciable change in the pulse or respiration. About 4 cm. of the lower œsophagus and most of the stomach at the lesser curvature and its upper third at the greater curvature were resected. The cut end of the œsophagus was sutured to the depressed skin edges laterally and the sutured stump of the stomach sutured to the skin margins in the midline. The diaphragm was sutured with chromic catgut and both pleural and peritoneal cavities were closed without drainage.

Immediately after the completion of the operation the patient was fully conscious and rational. Most of the operation was performed under local anæsthesia. The pulse was 130 and of fair quality. The blood pressure did not fall below 110 systolic and 102 diastolic. The convalescence was relatively uneventful.

On the fifth day feeding was begun through the gastric stoma, and on the fourteenth day a rubber tube connection between the stomas was made through which the patient swallowed liquids. On the twentieth day he swallowed liquids containing 1,800 calories. Later he was able to swallow cereals, milk toast, and similar foods. He gained weight and his hæmoglobin rose from 35 to 65 per cent.

The pathologic specimen showed an annular carcinoma of the stomach which had infiltrated beneath the mucosa, producing a mass measuring in the fixed specimen 9 by 7 by 2 cm. In areas the growth extended through the serosa. It involved the lower œsophagus. A number of lymph nodes showed metastasis. There was a margin of normal tissue above and below the growth.

This is the second reported case of successful combined resection of the cardia and the thoracic œsophagus; the first was reported by Zaaijer in 1913.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Cullen, T. S.: Further Notes on Diseases of the Umbilicus. *Surg., Gynec. & Obst.*, 1922, xxxv, 257.

The author reports the observations on diseases of the umbilicus which he has made during the six years since the publication of his book on this subject.

He quotes Logan's and Miles' descriptions of the frequency of tetanus in the newborn among the Chinese which is due to the lack of asepsis during labor and especially of care of the cord and umbilicus.

Granulation tissue at the umbilicus in the newborn appears as a small, red, pus-discharging mass in the umbilical depression. Histologically the surface is devoid of epithelium and covered with polymorphonuclear leucocytes. The outer layers are granulation tissue but the center may be more or less organized. In the treatment the base may be ligated with catgut and the top clipped away. Granulation tissue usually dries up under treatment with astringents.

Umbilical polyps originating in the omphalomesenteric duct resemble a cherry, secrete a relatively clear fluid, and are covered with intestinal mucosa. The author reported a case of umbilical polyp associated with a Meckel diverticulum. The polyp was excised and the stump of the diverticulum invaginated into the gut under a pursestring suture. This invaginated stump became congested and partially obstructed the gut lumen.

Goetsch, in 1919, reported a case with gastric mucosa in the tip of a Meckel diverticulum.

Cases of an accessory pancreas in the tip of Meckel's diverticulum have also been reported.

The author describes a case of Meckel's diverticulum containing an ordinary pin with its head buried in the wall of the diverticulum near the tip, the point of the pin lying free in the lumen. He mentions also two cases of malignant myomata associated with Meckel's diverticulum.

Umbilical infection is frequently caused by an accumulation of foreign material in the umbilical depression. The treatment consists in dilating the umbilicus, curetting away the concretion, removing any granulation tissue, and treating the umbilical area in the same manner as a superficial infection.

The author describes a case of tuberculous peritonitis with a tuberculous abscess opening at the umbilicus.

Fiaschi has described a chancre of the umbilicus in which spirochætæ were obtained. Rytina has reported a case of condyloma of the umbilicus which disappeared after antisyphilis treatment.

In 1919 the author reported bluish discoloration at the umbilicus as a diagnostic sign of ruptured extrauterine pregnancy. This would be expected only when there is free blood in the abdomen and probably is more apt to be encountered in thin persons. Occasionally the bleeding may be slow and persistent instead of sudden and severe. A large quantity of blood may accumulate in the abdomen without causing signs of shock. In such a case the umbilicus imbibes the blood and appears bluish.

Cullen has collected nine cases of atheromatous cysts of the umbilicus. These cysts, which may reach 3 or more centimeters in diameter, are usually

pedunculated, covered with skin, flaccid, and thin walled. They have smooth inner surfaces, are filled with grumous or crumbly material, and are lined with squamous epithelium devoid of hairs and sebaceous or sweat glands. The cyst contents consist of exfoliated squamous epithelium, fat droplets, and cholesterin crystals. The cysts are easily removed. In the author's opinion a small piece of attenuated skin of the umbilical scar may become buried and in time produce an atheromatous cyst.

Adenomyomata of the umbilicus occur only in women. These growths are small, but occasionally swell at the menstrual period and sometimes are associated with a slight escape of blood at the period. Histologically they consist of unstriped muscle and fibrous tissue with uterine mucosa scattered throughout the nodule.

The author has found one instance of a small nævus or hæmangioma of the umbilicus, and on one or two occasions has noted small pigmented moles.

Mention is made also of Carson's case of papilloma of the umbilicus arising from squamous epithelium. The papillary masses were covered by many layers of squamous epithelium, the superficial layers of which were hornified. Scattered between the epithelial cells were small round cells or polymorphonuclear leucocytes and many eosinophiles. Beneath the epithelium were young connective-tissue cells, small round cells, and polymorphonuclear leucocytes. The central stems of the papillary masses consisted of fibrous tissue.

A case of large pseudomucinous cyst of the ovary with several small pseudomucinous cysts at the umbilicus is reported.

Carcinoma of the umbilicus is classified as: (1) primary umbilical carcinoma of the squamous-cell type or adenocarcinoma; (2) secondary umbilical carcinoma from the stomach, gall-bladder, intestine, ovaries, uterus, and abdominal organs. Primary squamous-cell carcinoma of the umbilicus is rare. The author has collected only four cases. Carcinoma of the umbilicus is usually secondary to primary cancer of the stomach. Umbilical carcinoma secondary to carcinoma of the intestines and rectum is rare.

Sarcoma of the umbilicus is rare. The author describes a case of perithelial angiocarcinoma.

An amniotic umbilicus is characterized by absence of surrounding skin, the defect being replaced by amnion which is reflected upon the abdomen from the cord. The surrounding abdominal wall is usually intact.

Umbilical hernia at birth is probably due to one of three causes or some combination of them: (1) stretching of an amniotic umbilicus; (2) the escape of abdominal contents through a patent umbilicus; (3) failure of the intestines to recede into the abdomen. Prompt operative interference is the only treatment. Delay of a few hours may be fatal. Even after a short time the outer covering may become dry and the intestines may be cyanotic.

In dissecting intestinal loops densely adherent to the walls of an umbilical hernia patches of the sac wall may be left on the intestines. These patches should be trimmed off like the repair patches on the inner tube of a bicycle tire. Their surfaces are relatively smooth and do not bleed.

The author describes two cases of persistence of the urachus. WALTER C. BURKET, M.D.

GASTRO-INTESTINAL TRACT

Judd, E. S., and Lyons, J. H.: Resection of the Body of the Stomach for Ulcer; Report of a Series of Cases with End-Results. *Ann. Surg.*, 1922, lxxvi, 409.

The impossibility of distinguishing between benign ulcer and carcinoma of the stomach without microscopic examination makes some form of removal of the ulcer necessary. If the ulcer is large or high on the body of the stomach, if there are multiple ulcers, or if there is hour-glass constriction, resection in continuity is often the most simple operative procedure. This operation, also called transverse, sleeve, or middle gastric resection, is particularly adapted to ulcer with hour-glass deformity as it removes the lesion and, at the same time, relieves the obstruction.

Attention has been called to the fact that a stomach in which sleeve resection has been performed empties better than one in which a V-shaped excision has been done. For functional reasons Alvarez recommends the removal of a sleeve which is longer on the greater curvature than on the lesser.

Observations made at the Mayo Clinic on five patients who had test meals before and after operation indicate that after sleeve resection the reduction in acidity is considerable. De Quervain and Faulhaber and Redwitz report a similar decrease. Sufficiently numerous observations have not yet been made to determine whether the removal of acid-secreting mucous membrane is fully or only partially responsible for this decrease.

Opinion seems to be divided as to the advisability of using sleeve resection. Chief among the adverse criticisms offered is the probability of hour-glass constriction as a sequela. Judd and Lyons believe that this possibility has been over-emphasized. Several authors consider sleeve resection the operation of choice and have reported a high percentage (70–90) of complete, or very nearly complete, cures.

RESULTS OBTAINED DURING A PERIOD OF FOURTEEN YEARS

From 1908 to 1922, ninety sleeve resections were performed in the Mayo Clinic: one for angioma, one for lymphosarcoma, thirty-two for carcinoma, and fifty-six for benign gastric ulcer. The operations for ulcer were performed on thirty-seven women and nineteen men.

In two of the thirty-two patients with carcinoma it was necessary to resect the colon at the time of the

sleeve resection; in one, a gastro-enterostomy was necessary, and in one a pyloroplasty. In this group there were four operative deaths. Thirty-seven per cent of the patients who survived the operation and who have been traced are alive and well at least two and one-half years later. Ten patients died of recurrence after leaving the Clinic. None of the patients in whom glandular involvement was found at operation is alive.

As a group, the fifty-six cases in which resections in continuity were performed because of benign ulcer represent serious surgical problems. In this group there were three operative deaths, and one patient died after leaving the Clinic. Four of the fifty-six patients were operated on less than one year ago. Of the remaining forty-eight, 85 per cent have reported their condition, and of these, 70 per cent are cured. The average length of time between the operation and the last report is four years. Six patients reported that they were improved but not cured, and six considered the results unsatisfactory.

In fifteen cases a roentgen-ray examination was made at periods varying from one month to six years after the operation; the stomach was then found to be practically normal in shape, size, and position.

In considering mortality rates, the possibility of gastric cancer in patients believed to have gastric ulcer should be borne in mind.

INDICATIONS FOR SLEEVE RESECTION

Sleeve resection is not suitable for all cases, but the authors believe it can be employed to advantage more often than formerly. The simple V excision of gastric ulcer may result in almost complete retention. The lesion is more apt to be removed thoroughly by sleeve resection than by excision. Moreover, in cases of gastric ulcer the lesion in the stomach, although apparently benign, may be malignant and must be removed or destroyed, and in this case the sleeve resection seems to be the more logical procedure. When the ulcer is large, indurated, and in the central or cardiac third of the stomach, a sleeve resection can be performed with less technical difficulty than excision and gastro-enterostomy; there is less actual operating than in any other procedure and usually the technical steps can be carried out more accurately. In none of the Mayo Clinic cases was there necrosis of the gastric wall or giving way of the suture line, and even when the anastomosis was complicated, there was no interference with healing.

The principal objections to sleeve resection are that it removes too much of the unaffected gastric wall, and that it is often followed by contraction which results in hour-glass deformity. If the tumor is malignant there can be no objection to wide excision of the lesion, but if it is benign, as much good tissue should be preserved as is compatible with good results. For this reason it is best not to employ the procedure for small ulcers. If the ulcer is large, the deformity will often be less following a sleeve resection than following excision and gastro-enterostomy.

TECHNIQUE

The first technical step in the operation consists of separating the lesion from the surrounding structures. After the stomach has been freed, the gastrohepatic omentum is dissected away from the lesser curvature for a sufficient space and the gastrocolic omentum separated from the greater curvature. The area to be removed is clamped between two large Payr clamps. Rubber-guarded clamps are used to prevent soiling from the gastric contents as the segment is cut away with the cautery. These clamps are placed on each segment of stomach just beyond the large crushing clamps. The latter are then removed and the two segments joined. Two rows of catgut sutures are used to approximate the mucous membrane, the muscularis, and the peritoneal layers, and the anastomosis is completed by one row of interrupted silk sutures. The angles at the lesser and greater curvatures are supported by suturing the several parts of the severed omentum over them

CONCLUSIONS

The authors' conclusions are as follows:

In cases of carcinoma of the stomach the results of sleeve resection are as satisfactory as those of any other form of operation.

Sleeve resection is well suited for certain ulcers high on the body of the stomach, for large perforated ulcers, and for multiple ulcers. It is the ideal procedure in hour-glass stomachs.

The danger of hour-glass constriction following sleeve resection has been exaggerated.

The functional results of this operation are very satisfactory.

Holzweissig, M.: The Formation of Peptic Ulcer in the Jejunum (Ueber peptische Geschwuersbildung im Jejunum). *Zentralbl. f. Chir.*, 1922, xlix, 864.

For the development of a peptic ulcer the presence of digestive acid gastric juice is essential. If the latter cannot be demonstrated it is not possible to speak of a "peptic ulcer." For this reason the author doubts whether all of the fourteen cases of lesions in the vicinity of the ileocæcal valve which were recently collected by Fischer were true cases of peptic ulcer.

In a case reported in this article by Holzweissig a group of peptic ulcers were found just beneath the plica duodenojejunalis; the perforation of one of them had caused a fatal peritonitis. Acid was found in the abdominal cavity. The gastric juice had not been neutralized below the papilla of Vater because the latter was occluded by a stone. The local predisposition of the affected jejunal loop was due to the presence of two mesenteric lymphomata obstructing the circulation. RUGE (Z).

Carcones, A.: Foreign Bodies in the Intestine: A Rare Diagnostic Error (Fremdkörper im Darm, ein seltener Fall eines diagnostischen Irrtums). *Spitalsl*, 1921, 68, 383.

A boy 17 years old swallowed a pin. One year later he experienced an attack of severe pain in the right hypogastrium with nausea, vomiting, and retention of fæces. A diagnosis of appendicitis was made and ice applied to the abdomen. As the condition did not improve the patient was referred to the author.

At operation a small abscess walled off by adhesions was found in the ileocæcal region. The appendix, which was retrocæcal, was not inflamed. A pin pointed through the posterior wall of the ileum 5 cm. from the ileocæcal valve; only its head remained in the lumen of the gut. The pin was removed and an appendectomy was done. The patient was discharged at the end of four weeks.

WOHLGEMUTH (Z).

Huettl, T.: Primary Sarcoma of the Intestine (Primäres Darmsarkom). *Orvosképzés*, 1922, xii, 47.

The author discusses the pathologic anatomy and the clinical aspect of primary sarcoma of the intestine in connection with the case histories of six sarcomata of the small intestine, five of the colon, and four of the rectum. Sarcoma occurs in the various parts of the intestine with equal frequency. The ratio of carcinoma to sarcoma is 1:6.5. Huettl does not consider lymphosarcoma a true sarcoma, but calls it a "lymphadenoid sarcoma" (Ziegler). In this group he differentiates between lymphocytoma and the malignant lymphoblastoma (Ribbert). The true sarcomata he includes in the other groups: the sarcomata, myxosarcomata, melanosarcomata, giant-celled sarcomata, and alveolar sarcomata originating in the musculature and connective tissue of the intestinal wall.

In the small intestines and ileocæcal region the most common sarcoma is the round-cell sarcoma; in the colon it is the lymphadenoid sarcoma, while in the rectum it is the melanosarcoma. The four rectal sarcomata in the author's cases belonged to the group of non-melanotic sarcomata. It is very difficult to draw a sharp line between round-celled sarcoma and lymphadenoid sarcoma. A striking fact in Huettl's cases was that all of the lymphadenoid sarcomata metastasized along the lymph channels. The melanosarcomata include both very malignant tumors as well as benign tumors. It may be assumed that the pigment found in the cells is not of uniform origin.

Nine of the patients whose cases are reported were between the third and the fifth decades of life and the rest were under 30 years of age. There were twice as many men as women.

Sarcomata of the duodenum appear in the form of diffuse, flat infiltrations which form compact, nodular tumors. Sarcomata of the small intestine usually cause distention of the infiltrated part of the gut. In Huettl's opinion the distention results from destruction of the muscle elements. Lymphadenoid sarcomata which spring from the submucous layer and injure the ring musculature of the intestine also cause distention. Tumors originating from the insertion of the mesentery and growing toward the lumen of the gut cause constriction.

The clinical picture is very diverse. A pre-operative diagnosis is difficult as there is nothing characteristic in the history. The frequent association of the condition with tuberculosis can be explained by the assumption that as the lymphoid cells of the follicles of the intestinal wall form the point of origin of the lymphadenoid sarcoma, a sarcoma may arise from any chronic inflammatory collection of lymphocytes.

The course of the disease may be divided into two periods. During the first stage the complaints are indefinite but in the second stage the tumor is palpable. The mobility of the tumor, the blood picture, and the fever are not of much value in the diagnosis. Roentgenography is important. The most frequent complication is intestinal invagination. The prognosis is unfavorable.

An operative result may be expected only in cases of rectal sarcoma. Of the author's four patients three were still well one-half to one and a half years after the operation. Of the cases of sarcoma of the small and large intestine only one was cured and in this instance the tumor was an ileocæcal giant-cell sarcoma. In the others the condition was found to be inoperable at operation or recurred a short time afterward.

The lymphoid and the infiltrative sarcomata are particularly malignant; the process is only hastened by operation. The picture is similar to that usually seen after extirpation of the spleen for leukæmia: following transient improvement the condition rapidly becomes worse. For such cases Huettl recommends roentgenotherapy combined with the administration of arsenic.

VON LOBMAYER (Z).

Warnshuis, F. C., and Lampert, M.: A Penetrating Wound of the Perineum with Puncture of the Intestine. *J. Am. M. Ass.*, 1922, lxxix, 896.

A boy, aged 16 years, slid down the side of a haystack onto a broken pitchfork handle. The handle penetrated the right perineum about 1 in. from the rectum for a distance of 6 to 7 in. The boy pulled out the handle, lay down for an hour, and then walked to the farm house. To relieve the severe abdominal pain he was given morphine and codeine.

Upon his arrival in the hospital, twenty-four miles distant, about eight hours after the accident, his temperature was 101.4 degrees F., his pulse 118, and his respiration 18. His color was good. The abdomen was hard and contracted, the recti being spastic. Complaint was made of cramps and pain in the lower abdomen.

On general percussion dullness was noted. A catheterized specimen of urine was normal. The

ragged, penetrating, stellate perineal wound did not bleed. Proctoscopic examination showed no injury to the rectum. Immediate exploratory operation was advised.

With the patient under ether anæsthesia the abdomen was opened in the midline. Fluid and intestinal contents escaped. Food and fæcal material were found widely disseminated. A lacerated wound of the ileum, about 16 in. above the cæcum, through which intestinal contents were escaping, was closed with two layers of inverting sutures. The intestines were found covered with exudate and were deeply injected. The penetration of the peritoneal cavity was discovered at the right of the pelvic peritoneum; it did not involve the ureter or prostate gland.

After the abdomen had been freely flushed with salt solution, the abdominal wound was closed around two tube drains reaching to the pelvis. Another tube was then inserted through the perineal wound until it came into contact with the abdominal tubes, thus making through-and-through drainage. The perineal tube was fixed in position with a silkworm gut suture. The operation lasted thirty-five minutes.

The patient was given continuous proctoclysis, kept in Fowler's position, and given 1,500 units of antitetanus serum. The respirations were kept between ten and twelve by frequent doses of morphine. There was no postoperative nausea or vomiting. Water was given freely by mouth. Frequently changed, moist hot pads were applied to the upper abdomen and both sides. After twenty-four hours the pulse was 136 and the temperature 102.4 degrees F. Both gradually returned to normal. On the fourth day the patient had a normal bowel movement.

For the first thirty-six hours there was considerable serous cloudy drainage from the perineal and abdominal tubes. This gradually subsided and the tubes were removed on the fifth and sixth days. The patient made an uneventful recovery and was discharged in good condition on the sixteenth day.

In the authors' opinion pain is one of the first and most important signs of injury of the abdominal contents, and when there is doubt as to the presence of an intra-abdominal injury exploratory operation is advisable. Early operation will reduce the mortality. Through-and-through drainage is effective. It is more readily possible in the female. Intestinal contents soiling the viscera are best removed by free saline flushing and vacuum aspiration.

The authors give sufficient morphine for three or four days to reduce the respirations to ten or twelve. Water should be given freely by mouth and proctoclysis and supplemented by intravenous and subcutaneous injections of saline solution. Nausea and vomiting should be treated by frequent gastric lavage. Early blood transfusion is of value.

WALTER C. BURKET, M.D.

Polenoff, A.: Ptosis of the Proximal Portion of the Colon from the Clinico-Surgical Standpoint (Ptose des proximalen Dickdarmabschnittes in klinisch-chirurgischer Hinsicht). *Neues Chir. Arch.*, 1922, ii, 57.

A predisposition of the proximal portion of the colon to congenital variations is due to the late conclusion of its embryonic development. The more common secondary changes of form and position are caused by inflammatory processes. No definite conclusions have been reached regarding the nature of Jackson's membranes and their pathological and anatomical relationships. Such changes, or those originating in another manner, lead to a vicious circle, as inflammatory processes may be both the cause as well as the result of mechanical disturbances.

Ptosis of the colon occurs more frequently in females than in males; the latter include particularly those who are obliged to stand a good deal, are emaciated, and subsist on bulky food. In the first stage of the condition there is stasis of the intestinal contents, particularly in the cæcum, the symptoms consisting of constipation, periodical flatulence, and slight pain in the right iliac region. Only in the second stage, when ataxia and dilatation of the cæcum are superimposed on the stasis, does the subject feel really sick. The constipation and pain then become more intense, force the patient to remain in bed for two or three days, and are sometimes associated with nausea and vomiting.

In the third stage the right half of the transverse colon sinks, the hepatic flexure becomes angulated, and the transverse colon may course partly parallel to the ascending colon. As later the left half also sinks and must then rise abruptly to the splenic flexure which remains fixed, and as the omentum which is drawn to the right exerts pressure, stasis becomes complete in the entire colon up to the descending portion. Slight symptoms of ileus may develop or those suggesting ulcer of the stomach or duodenum.

In the differential diagnosis the important features are the complete, if only temporary, disappearance of the pain after certain postures, massage, etc., and the absence of characteristic points of pain. Because of the inflammatory changes the condition may suggest appendicitis, but is not identical with it.

The surgical treatment should not be confined to an appendectomy. A toilet of the entire right half of the abdominal cavity should be undertaken; therefore sufficiently long incisions must be made. Inflamed portions of the omentum must be resected as such an omentum may maintain a colitis even in the absence of adhesions and bands. Adhesions, bands, and membranes which inhibit peristalsis, fix coils of intestine to one another, or cause kinking of the transverse or ascending colon must also be removed. The hepatic flexure should always be sought out carefully as usually it will be found bound by bands and adhesions. Occasionally the tæniæ are transformed in certain areas to firm whit-

fat-yellow strings. These should be separated by longitudinal invagination of serosa or the application of free omental flaps to parts not covered with peritoneum. Dilatation of the cæcum should be treated by cæcoplication.

In regard to cæcum mobile, the author states that he is inclined to the opinion that a free cæcum is usually preferable to a fixed cæcum as not rarely he has observed aggravation of the condition following artificial fixation. Of the more radical procedures, resection is rarely indicated. Anastomosis, especially between the ascending and transverse colon, has frequently been done with good results and in a period of twelve years has not been the cause of a single fatality.

VON DER OSTEN SACKEN (Z).

Noordenbos, W.: Extirpation of the Transverse Colon with the Carcinomatous Stomach (Ueber Extirpation des Colon transversum en masse mit dem carcinomatösen Magen). *Nederl. Tijdschr. v. Geneesk.*, 1922, lxvi, 1380.

Up to the present time surgical literature contains the reports of thirty-nine cases of gastric cancer in which the stomach and a large or small part of the transverse colon were removed in a one-stage operation. The mortality of this procedure was about 33.9 per cent. Such an extensive resection is necessary when the cancer of the stomach has invaded the transverse colon or the mesocolon, and when the colon is endangered by injury of the middle colic artery. Cases are known, however, in which unrecognized ligation of the middle colic artery did not result in gangrene of the colon. As the fate of the colon in such cases can never be definitely foreseen, Perthes established the principle that whenever the middle colic artery is included in the cancerous area a routine resection of the transverse colon, the mesocolon, and the stomach should be done in a one-stage operation. Perthes reported cases in which this was done in 1913–1914 and showed that the mortality was no greater than that of resection of the stomach alone for cancer. It is very evident that when there is extensive adhesion of the cancer to the mesocolon the disease has progressed very far and radical interference is well justified. Oppel and Kuettner have reported similar cases.

The author has operated on two cases in the manner described. The first patient is still alive today, eight years after the operation. The second patient, who was affected also with syphilis, died following the operation. The histories of these cases are given in detail. It has been definitely proved that persons with such far-advanced cancers may be brought to a state of well-being for years by means of the operation described.

When a cancer of the colon invades the stomach, the conditions are similar and the same operation is applicable. In many of these far-advanced cases a gastrocolic fistula develops. The fistula is demonstrable in the roentgenogram. It is found almost always in cases of cancer and much less frequently in cases of benign ulcers.

In its relation to the colon, syphilis of the stomach may present a picture similar to that of gastric cancer. It is therefore important to bear in mind the fact that a syphilitic lesion is usually located in the pyloric portion of the stomach while a gastric cancer is generally found in the body of the stomach.

KOCH (Z).

Hirschman, L. J.: The Value of Temporary Colostomy. *J. Am. M. Ass.*, 1922, lxxix, 1021.

All forms of chronic colitis should be treated by temporary colostomy to relieve its two chief manifestations, hyperperistalsis and hypersecretion.

Patients of another large class, those suffering from the later manifestations of specific diseases, strictures, complicated fistulæ, and benign or malignant neoplasms, are often rendered curable by the employment of temporary colostomy before the indicated major surgery is carried out. Temporary colostomy is of distinct value also in the treatment of malignant growths which appear inoperable, and when radium or deep high-voltage roentgen-ray therapy is employed.

Many types of colitis are entirely cured by appendicostomy and cæcostomy combined with the indicated medical and dietetic therapy.

Hirschman prefers regional anæsthesia induced by the infiltration of a 0.5 per cent solution of apothesin or procain. Epinephrin is not used. If general anæsthesia is required he uses gas and oxygen with local anæsthesia. One hour before the operation ¼ to ⅓ gr. of morphine sulphate with from 1/150 to 1/100 gr. of scopolamine hydrobromide is given.

It is not necessary or advisable to suture the skin, fascia, or peritoneum to the bowel as adhesions will form between the cutaneous abdominal surfaces and the bowel wall within a few hours.

It is the author's practice to place the exposed loop or colon as high in the wound as possible so that it will be well out of the way if further abdominal surgery is necessary for the removal of disease in the pelvis, colon, or rectum. The abdominal wound below the colonic loop is sewed in layers and the skin closed with clips. The parts are dusted with zinc stearate powder, pads are applied under the ends of the supporting rubber tube, a dressing is applied to the wound, and the patient is returned to bed until the bowel is opened forty-eight hours later.

If it is desired to divide the spur of the colostomy by pressure necrosis at the time of bowel closure, the two loops of the bowel must be sewed together for 3 or 4 in. at their mesenteric attachment. The author found it unnecessary to do this, however, as closure may be done under local anæsthesia extraperitoneally by means of simple invaginating sutures and without any anæsthesia whatever.

After the bowel has been closed it is dressed with dichloramine-T solution for four or five days. When

healing is complete and the wound has been proved sterile by bacteriological examination, the peritoneal cavity is opened under local anæsthesia, the bowel replaced, and the wound closed in layers.

CARL R. STEINKE, M.D.

Jones, D. F., and McKittrick, L. S.: End-Results of Operations for Carcinoma of the Rectum. *Ann. Surg.*, 1922, lxxvi, 386.

Some surgeons believe that carcinoma of the rectum always, or nearly always, remains localized in the bowel, and that therefore an extensive operation is not necessary. A second group believes that the posterior operation gives as good late results and has a much lower immediate mortality than the abdomino-perineal operation. The mortality of the posterior operation as recently given by Lockhart-Mummery was 5 per cent, while Crile reported twenty cases without a death. According to a third group, as much intestine can be excised from below as from above. The authors state, that while this may be true, it is usually impossible to remove more than a small part of the peri-rectal fat and mesentery from below and that if it is not necessary to excise peri-rectal fat and mesentery, the posterior operation is adequate.

Up to 1915 probably not over 25 per cent of the cases seen were operated upon, and after this careful selection the mortality of operation by the posterior route was 16 per cent, and of those surviving the operation only 16 per cent lived three years. Therefore only about 4 per cent of the patients seen lived for three years. This is contrary to the statistics of Hausmann indicating that of patients dying of carcinoma of the intestines only 50 per cent show any growth outside of the bowel wall. If this is true, about 50 per cent of persons operated on by the posterior route should survive instead of only 4 per cent. In Cripps' series of cases, which is the best for the posterior route, it is found that 9 per cent of the total number of patients seen were alive three years later.

Considering the most extensive operation, the combined abdomino-perineal operation of Miles, in which there is no possibility of implantation of cells from the growth, it is found that 22.7 per cent of the total number of patients seen are alive at the end of three years and 11.3 per cent are alive at the end of five years. This is a great improvement over the posterior operation but far from the 50 per cent of permanent cures which Hausmann's statistics would lead one to regard as the goal of the surgeon.

The value of the various operations should be determined definitely by figures rather than by the impressions of surgeons. The operation of choice is the procedure which gives the largest number of living patients at the end of three or five years out of the total number seen. Any operation, regardless of a low immediate mortality, is of very little value if it can be applied to only 25 per cent of the cases seen. The fact remains that we are able to operate upon not more than 65 per cent of the patients seen and only 11.3 per cent of the total number are alive five years later even when an extensive operation was performed. Not over 2 per cent of all are alive ten years later.

In the author's series the mortality for the abdomino-perineal operation was 8 per cent. In the last eleven cases there were no deaths. Fifteen of the patients operated upon died in three years or less and 92 per cent of these had metastases in the liver, regional glands, and peri-rectal tissues.

H. W. FINK, M.D.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Reichle, R.: A Contribution to the Surgery of Injuries to the Liver (Beitrag zur Chirurgie der Leberverletzungen) *Beitr. z. klin. Chir.*, 1921, cxxvi, 621.

Reichle reports twenty cases of injury to the liver treated at the Allerheiligen Hospital at Breslau. Eighteen were subcutaneous ruptures, and two, gunshot injuries. The total mortality was 11.55 per cent, that of the complicated ruptures 100 per cent, and that of the uncomplicated ruptures, 37.5 per cent. Of the two cases of gunshot injury, one, complicated by laceration of the kidney, was fatal.

The symptoms of injury to the liver are uncertain; hence it is difficult to decide on the indications for operation. Reichle advises early operation whenever such injury is suspected, basing his advice on the disproportion between the apparently slight symptoms of injury during the first few hours and the severity of the operative findings a short time later.

In seven cases the cause of death was primary hæmorrhage (five times from rupture of the liver, once each from injury to the vena cava and rupture of the spleen).

Present-day treatment consists in suture or tamponade. A serious complication is the sequestration of portions of the liver which have been deprived of proper nutrition. When hæmorrhage has been very severe, intravenous reinfusion of fluid blood from the abdominal cavity has been found of great value; its effect in most cases was striking. To every 100 c. cm. of blood, 10 c. cm. of 2 per cent sodium citrate should be added. NAEGELI (Z).

Martens, E.: Anatomical Bases for Resections of the Liver (Anatomische Grundlagen fuer Resektionen an der Leber) *Beitr. z. klin. Chir.*, 1922, cxxvi, 629.

The distribution of the vascular system in the liver divides the organ into two parts, each of which may be regarded as independent. This division holds good, however, only for the vessels entering and leaving the hilum. Because of the early branching off of the cystic artery the gall-bladder is an unpaired organ which can be included in the right system as well as in the left.

The peripheral anastomoses in the regions of the hepatic artery and portal veins are too unimportant to secure nourishment to portions of the liver shut off from the chief afferent vessel. In rare cases the isolated portion of the liver may be nourished after ligation of a hepatic artery by the arteries of the hilum. The ligation of an arterial branch and a branch of the portal vein preliminary to resection of the liver makes it necessary to keep to the line which separates the tissue attacked by necrosis from the healthy tissue. Theoretically this line (the medial border of the gall-bladder or the right border of the caudate lobe, makes resection of a lobe possible; on account of the danger of progressive thrombosis of the portal vein, hæmorrhage may be controlled best on the resection surface (Wendel).

The hepatic veins have three divisions and take their directions according to the anatomical division of the lobes of the liver. For these, the employment of intrahepatic ligation comes into consideration since they are injured by the incision. NATOLI (Z).

Moore, F. D.: The Associated Pathology of Gall-Bladder Disease, with a Further Plea for Cholecystectomy. *Surg., Gynec. & Obst.*, 1922, xxxv, 358.

Gall-bladder infection is more frequent than is generally supposed and disease due to or associated with disease of the gall-bladder is very extensive and frequently overlooked. Disease associated with cholecystitis may include practically any abdominal organ and any structures in a distant part of the body.

In no case of diseased gall-bladder should the surgeon be content with the removal or other treatment of the primary condition alone; he should look also for possible secondary involvement.

The author urges cholecystectomy in preference to cholecystostomy. He cites as his reasons that following cholecystectomy the greater percentage of cases have no recurrence of symptoms, fewer adhesions are formed, biliary fistulæ occur much less frequently, the re-formation of calculi is very unusual, cholecystitis does not recur, and convalescence is more rapid. H. A. MCKNIGHT, M.D.

Lecène, P., and D'Allaines, G.: The Repair of the Principal Bile Duct or Its Implantation into the Gastro-Intestinal Tract in Difficult Cases (La réparation de la voie biliaire principale ou sa dérivation dans le tube digestif dans les cas difficiles) *J. de chir.*, 1922, xx, 257.

Formerly there were only three operative methods to re-establish the continuity of the principal bile duct, viz., direct suture of the extremities of the sectioned canal, anastomosis with the duodenum or stomach, or anastomosis of the gall-bladder to the intestine. Today, in addition to these procedures, there are three others from which to choose:

1. Suture of the two ends of the divided bile duct over a rubber tube.

2. Hepato-duodenal or gastric implantation over a rubber tube with suturing of the bile ducts and intestine in one or more planes.

3. Reconstruction of the bile duct by means of a rubber tube implanted in the stomach or duodenum without direct suture.

The author reviews and discusses the cases reported in the literature in which these methods were employed.

In the sixteen cases in which the first method was used there were seven operative recoveries, five later recoveries, one incomplete recovery, one complete failure, and two deaths. The use of the second method in thirteen cases was followed by one immediate and complete recovery, five late recoveries, two incomplete recoveries, one unknown result, and four deaths. The twenty-three cases operated on by the third method consisted of two cases of accidental section in the course of a biliary operation, six cases of stricture following a previous operation, five cases of neoplasm, and ten cases with a more or less old biliary fistula. They were thus among the most difficult types of cases met with in biliary surgery. The third method of operation is easier than the others and its results were better. The twenty-three operations were followed by two unknown results, one partially successful result, two recoveries lasting for twenty-six and eight months respectively, fourteen complete recoveries, and four deaths.

From their study the authors draw the following conclusions:

1. Early suture, simple approximation of the two ends over a rubber tube, is suitable for cases in which the two ends are easily seen. Accidental section of the bile ducts with an immediately recognized loss of substance seems to be the typical indication for this method.

2. Hepatoduodenal or gastric implantation over a rubber tube with direct suture is suitable for cases in which the upper end can be reached so that a supporting suture can be applied, a little of the biliary canal can be dissected, and the duodenum or stomach can be mobilized in an operative region not modified too much by adhesions.

3. Reconstruction of the biliary tract by means of a rubber tube with gastric or duodenal implantation and without direct suture is applicable to the most complicated surgical cases, particularly fistulæ of the principal bile duct.

The use of the rubber tube is an important advance; direct suture is often a valuable aid but is not indispensable, and there should be no hesitation in omitting it when it entails difficult and dangerous manœuvres.

Omentoplasty may be added to the operative procedure as it permits a better reconstruction of the principal bile passage.

A greater number of cases is necessary to judge of the value of these operative procedures but the number is already sufficient to warrant the conclusion that the operations give very good results in particularly difficult cases. The chief danger is ultimate stricture of the anastomoses and ascending biliary infection. W. A. BRENNAN.

Zoepffel, H.: Preliminary Stages of Acute Necrosis of the Pancreas, and a Contribution to the Advisability of Early Operation in Cholelithiasis (Vorstufen der akuten Pankreasnekrose, zugleich ein Beitrag zur Zweckmaessigkeit der Fruchoperation bei Gallensteinleiden). *Klin. Wchnschr.*, 1922, i, 1203.

Acute necrosis of the pancreas was observed ten times in 150 operations on the bile ducts. The condition is a complication of cholelithiasis. When a stone is incarcerated in an end portion common to the excretory ducts from the liver and the pancreas, the pancreatic ferment is activated by the bile which passes over into the pancreas; taking infectious material with it. Autodigestion of the glands and acute necrosis of the pancreas result. If infection is present the latter may be caused also by obstruction to the flow of the pancreatic secretion alone.

The prognosis is extremely unfavorable if the acute stage persists a number of days. It is more favorable in cases running a subacute course with occasional flare-ups, even though the necrosis of the pancreas may be extensive. The preliminary stage of acute necrosis of the pancreas is seen in cases which have not yet progressed so far as the formation of necroses, but the pancreas and the tissues immediately surrounding it are permeated and covered over by a glassy œdema. The author observed three such cases with typical gall-stone findings; operation was performed within the first twelve to twenty-four hours. No severe changes had yet been caused in the pancreas by the occlusion of the choledochus. These three cases were cured, while in those which were operated on later than twenty-four hours from the onset, the mortality was 100 per cent.

The conclusion drawn is that cholelithiasis should be operated on early. The possibility of a beginning acute necrosis of the pancreas must be borne in mind when there occurs in the course of cholelithiasis an attack of pain in the upper abdomen which is similar to that of perforation, but localized more to the left. FISCHER (Z).

Lindsay, E. C.: A Case of Multiple Pancreatic Calculi: Removal and Recovery. *Lancet*, 1922, ccii, 612.

Multiple pancreatic calculi are rare, and relatively few cases of operative removal have been reported. Lindsay's case was that of a man aged 29 years who had a fifteen-year history of colicky epigastric pain lasting for periods of two days to a week. Food increased this pain. There was no radiation. Slight but continuous wasting had been noted for two years. There was no jaundice and there had been no change in the stools.

At examination the urine was found free from sugar. The X-ray showed irregularity on the lesser curve of the stomach which suggested a penetrating ulcer, but another view showed that the shadows were outside of the stomach.

At operation the pancreas was exposed by an incision in the gastrohepatic omentum and an incision made over the most prominent of the masses felt in the organ. The duct was opened and six large stones were removed. The ducts were dilated, their walls were thickened, and the gland tissue was relatively thinned throughout. The duct was resutured and a tube drain inserted.

There was drainage from the tube for two days. On the sixth day the tube was removed. Convalescence was uneventful.

The calculi consisted of calcium carbonate with a small admixture of oxalate of calcium and magnesium. Cultures of the pancreatic fluid were negative. S. J. SEEGER, M.D.

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Bloodgood, J. C.: Tumors of Bone. *Northwest Med.*, 1922, xxi, 308.

There are certain data in the history that are of great importance in the diagnosis of a bone lesion. If the patient is under 15 years of age and the X-ray shows that the lesion is central, it is not sarcoma. If the X-ray shows that the lesion is periosteal, it is just as apt to be a sarcoma as not a sarcoma. If the X-ray shows that the lesion is periosteal and involves more than one bone, it is not sarcoma, nor metastatic carcinoma, nor any hopeless disease. A multiple periosteal lesion is benign, but may become malignant later as in the so-called Paget type. If the lesion is central and multiple it may be benign or malignant. If the patient is under 15 years of age it is not malignant, but if the patient is over 15 years it may be one or the other.

In interpreting the X-ray picture it is of great importance to compare the diseased bone with the opposite bone. It must be remembered that there may be an area of bone formation in front, and of bone destruction behind, and if they overlap the X-ray may not show the process.

The author has found Bence-Jones bodies in the urine only in cases of multiple myxomata and metastatic carcinoma. Syphilis is always suggested by periosteal lesions, but in no case of syphilis is there an intact bone shell with a central shadow.

If the patient with a central bone lesion is under 15 years of age sarcoma is excluded and the diagnosis rests between the common bone cyst, the less frequent giant-cell tumor, and the rare chondromyxoma. The common bone cyst usually becomes cured without any treatment. Giant-cell tumors predominate in patients over 15 years of age. Myxoma may occur at any age and is the most difficult of all bone tumors to cure without amputation.

The probability of a cure of periosteal or central sarcoma is present in not more than 4 per cent of the cases. Giant-cell tumors, bone cysts, and syphilitic periostitis were formerly confused with sarcoma and included in the percentages of cure by amputation. The author does not favor amputation for central bone tumor unless the disease has destroyed the limb, because the majority of cases are not sarcoma and the probability of cure is very small. Delay will do no harm in cases of chondroma, myxoma, and bone cyst, but the giant-cell tumor, which can be permanently cured without loss of function, is cured more easily if there is an intact bone shell. Only curettage is necessary. Left alone, the giant bone tumor will destroy the bone shell and infiltrate the soft parts as completely as the most malignant sarcoma, but will never give rise to metastases. After curetting, the author uses carbolic acid and alcohol, 50 per cent zinc chloride, or the cautery. Actual cauterization does not interfere with ossification.

Bloodgood favors immediate operation on all patients over 15 years of age who have a bone with a central cavity with a shell. Myxoma should be cut into with a cautery only. If not, it will recur as it will be transplanted into the fresh wound. Chondroma also is implanted in this manner. After the cauterization, carbolic acid, alcohol, and zinc chloride may be used. The treatment of the cavity depends upon its size. Some cavities are left open, others are closed, and others require bone transplantation. DANIEL H. LEVINTHAL, M.D.

Perna, G.: The Ossification of the Acetabulum and the Significance of the Supra-Acetabular Tubercle in Man (Sulla ossificazione dell'acetabulum e sul significato del tuberculum supracotyloideum nell'uomo). *Chir. d. organi di movimento*, 1922, vi, 485.

The author's long and well-illustrated article is an epitome of the various theories as to the development of the acetabulum and reports his own investigations in the Anatomical Institute of the University of Bologna. From his studies Perna reaches these general conclusions:

1. In the formation of the walls of the acetabular cavity in man three bones take a predominant part. Because of their situation these may be called the anterior, posterior, and superior acetabular bones.

2. The anterior acetabular bone originates from the confluence of multiple bony nuclei which arise at different age periods and are of different morphology. The first to become manifest is the nucleus of the acetabular bone in the fundus of the acetabular cavity. To this are successively added (about the second half of the eighth year) other secondary nuclei—the lateral and medial iliopubic and pubo-ischiatic nuclei of Staurenghi—which together constitute the complementary ventral bone of the acetabular cavity. At its complete development (the seventeenth year), the anterior acetabular bone almost entirely invests the lateral extremity of the horizontal branch of the pubis and extends more or less on the ventral part of the acetabular surface of the ilium, definitely forming all the ventral segments of the facies lunata. In it can be distinguished, however, a glenoidal and an articular lamina which form a T corresponding to the iliopectinal line. The first never projects beyond the lower margin of the semilunar surface, while the second is interposed completely between the ilium and pubis and in small part between the pubis and ischium, corresponding to the more elevated portion of the ischiopubic articulation in the acetabular fundus. The upper sub-margin forms the anterior segment of the acetabular ridge and shows a depression in the medial portion lateral to the iliopectinal eminence which may be called the ventral depression of the acetabular ridge. After the eighteenth year it fuses with the neighboring bones, first with the pubis, then with the ilium, and finally with the ischium.

3. The posterior acetabular bone originates from the confluence of various bony nuclei which appear toward the ninth year in the dorsal cartilaginous branch, corresponding to the cartilaginous acetabular ridge, and successively, during the sixteenth and seventeenth years, fuse with the accessory nuclei which become manifested in the remaining ilio-ischiatic cartilage—the lateral and median ilio-ischiatic nuclei of Staurenghi. After its complete development it occupies the entire extent of the ilio-ischiatic cartilage, constituting a triangular bony wedge interposed between the ilium and ischium and forming the cephalic half of the posterior segment of the facies lunata and the corresponding acetabular ridge. A thin lamina which continues its mediodorsal margin reaching the anterior contour of the great sciatic notch and the acetabulum does not ordinarily project beyond the limit of the semilunar surface. Its lower acetabular angle extends more or less regularly on the ischium, and its upper angle and acetabular margin more or less on the body of the ilium. In the middle part of the posterior acetabular bone is a depression which may be termed the dorsal depression of the acetabular ridge. After the seventeenth year this bone fuses with the neighboring bones, first with the ischium and then with the ilium.

4. The superior acetabular bone originates from a nucleus manifested after the eighth year in the thickness of the cephalic segment of the cartilaginous acetabular segment where it meets the marginal cartilage of the ilium. It later acquires the form of a triangular pyramid with an acetabular surface which completely or in part forms the upper segment of the facies lunata (head of the acetabulum), with an articular surface which first articulates and then fuses with the body of the ilium, and an extra-acetabular or anterior surface. The margin interposed between the acetabulum and anterior surfaces forms the cephalic segment of the acetabular ridge which is differentiated by a thick elevation in the anterior surface of the bone under discussion. This elevation constitutes the supra-

acetabular tubercle. When completely developed the bone may be quite isolated from the other acetabular formations but frequently articulates and becomes fused with the anterior and posterior acetabular bones. When this articulation does not occur, more or less deep and extensive incisuræ occur in the spaces between the acetabular bones. These may be termed the cephalo-ventral and the cephalo-dorsal incisuræ of the acetabular ridge. The superior acetabular bone is at first independent of the epiphyseal nuclei of the inferior anterior iliac spine but after the eighteenth year fuses with it and then with the body of the ilium.

5. These three bones form the maximum part of the facies lunata. The fundus of the acetabulum is developed chiefly from the ischium and partly from the ilium.

6. When the acetabular bones are well developed and articulate, the acetabular cavity is rather deep and united by a raised acetabular ridge which, with the exception of the dorsal and ventral incisuræ, does not show any irregularities.

7. The anterior acetabular bone has a special morphological importance since, besides its epiphyseal character, it contains portions of the acetabular bone which is considered a fourth fundamental piece of the innominate bone. The anterior acetabular bone represents the acetabular epiphysis of the pubis. The posterior and superior acetabular bones may be considered as epiphyseal bones of the ischium and ilium respectively. The superior acetabular bone is a characteristic of the human species because of the important function of the cephalic walls of the acetabulum in sustaining the entire weight of the trunk in the erect position.

8. The bony ridge of the supra-acetabular tubercle which is separated from the acetabular ridge by a sulcus formed in the extra-acetabular surface of the upper acetabular bone gives implantation to the iliofemoral ligament of the hip joint and frequently to the minor iliac muscle. This also is a characteristic of the human species as such formations have a great functional importance in the erect position.

9. On account of its origin and its independence of the other acetabular formations the superior acetabular bone must be of special practical importance because if it is absent or malformed or there are lesions of the muscles inserted in it, true malformations of the hip joint result from non-development or deficiency in the highest part of the facies lunata. As this is a characteristic of the human species, the malformations due to defective development reduce the acetabulum to the forms found in lower species.

W. A. Brennan.

Alberti, O.: The Metatarsophalangeal Syndrome of Koehler (La sindrome metatarsofalangea del Koehler). *Chir. d. organi di movimento*, 1922, vi, 569.

The author reports six cases of Koehler's syndrome of the second metatarsophalangeal joint. These cases varied in their intensity, but were identical in character, there being in every instance pain in the joint in the erect position and in walking, varying swelling on the dorsal surface, apparent shortening of the second toe, and irregularity of the joint noted on palpation, etc. The most interesting and characteristic findings are those shown in roentgenograms, viz., thickening of the distal half of the second metatarsal, frequently with disappearance of the margin, and varying deformity of the metatarsal head which, in the beginning, suggests osteochondritis dessicans but later shows widening and flattening of the articular surface. The proximal phalanx of the second toe is secondarily deformed by widening of its base and the articular surface. In consequence the articular space becomes altered. Sometimes the peri-articular tissues show calcification and osteophyte formations.

The course of the condition is very slow, and the prognosis is usually favorable. At most, resection of the joint is necessary.

The pathogenesis is complex. The condition has been attributed to various causes. The author ascribes it to the following factors:

1. The presence of anatomicophysiological conditions responsible for the selective localization of the lesion in the second metatarsophalangeal joint the head of which is normally the principal point of support of the foot and hence is exposed to the greatest weight. The second toe projects in front of the others and therefore is more exposed to trauma.

2. General pathologic conditions predisposing to alterations in the growing layer of the articular cartilage and interfering with chondral ossification of the metatarsal head.

3. Concomitant causes represented especially by trauma such as the weight of the body acting on tissues already pathologically disposed.

From such causes a disturbance in nutrition might arise in the process of chondral ossification of the metatarsal head, causing first osteochondritis and later, deforming chronic arthritis.

W. A. Brennan.

Roth, P. B.: Two Cases of a New Metatarsal Disease. *Proc. Roy. Soc. Med.*, Lond., 1922, xv, Sect. Orthop., 80.

The author's first case was that of a woman, 37 years old, who complained of pain and swelling in the right foot for five weeks. The X-ray showed swelling on both sides of the second metatarsal bone. There was no history of injury. The Wassermann test was negative. After treatment with 3 gr. of potassium iodide a day for one month, the patient was much better but not cured.

The second case was that of a nurse, 22 years old, who complained of pain and swelling on the dorsum of the left foot at the base of the second and third toes. The X-ray showed swelling on the outer side of the shaft of the second metatarsal bone at the junction of the middle and distal third, and a slight

swelling at the junction of the proximal and middle third. The Wassermann test was negative, and there was no history of injury. The patient was treated with complete rest and 3 gr. of potassium iodide a day for five weeks. A complete cure resulted.

JOHN MITCHELL, M.D.

FRACTURES AND DISLOCATIONS

Schlegel, A.: An Unusual Case of Retrosternal Dislocation of the Clavicle (Ein seltener Fall von Luxatio clavicularis retrosternalis). *München. med. Wchnschr.*, 1922, lxix, 511.

The author first gives a theoretical explanation of the movements of the clavicle in the sternal joint and of the evolution of a retrosternal dislocation of the clavicle and then reports a case of the latter type.

The diagnosis was certain from the appearance. In addition, there were symptoms of intrathoracic pressure and a distinct difference in the pulse in the two carotid and radial arteries. Motion in the arm was limited to lateral extension to the horizontal.

Operation was performed, as in most of the cases of retrosternal dislocation of the clavicle hitherto reported. Reposition with fixation was not possible on account of complete cutting away of the capsule; therefore a piece 3 cm. in length was resected from the clavicle.

At the end of three months an almost complete cure had been obtained. It would thus appear that resection is the method of choice in the treatment of dislocation of the clavicle with pressure symptoms.

DENCKS (Z).

Saner, F. D.: Fracture-Separation of the Lower Humeral Epiphysis. *Practitioner*, 1922, cix, 244.

Fracture-separation of the lower humeral epiphysis, which is seen most frequently between the ages of 6 and 12 years, may be due to direct or indirect violence.

There are two common types. The first consists of partial or complete separation of the epiphysis with a small fragment from the diaphysis which remains attached to the epiphysis. In the second, the line of fracture is just above the epiphyseal line or may partially involve it. Usually the line of fracture is through the condyles. The latter type is the more common of the two, and is usually due to direct violence. The former is usually caused by indirect violence.

When the violence is indirect, the forearm with the small humeral fragment is driven backward, the upper end of the lower humeral fragment is tilted forward, the periosteum on the posterior surface of the humerus is extensively stripped up, the structures of the elbow joint are injured, and there is extensive effusion of blood into the surrounding muscles and subcutaneous tissues.

Manipulation of the elbow or arm for the purpose of diagnosis is to be avoided. An accurate diagnosis is impossible without an X-ray examination. Roentgenograms in two planes and control roentgenograms of the sound elbow for comparison are necessary.

If any degree of displacement is present, an attempt at reduction should be made immediately under full anæsthesia. The arm should be held firmly while steady traction is applied to the wrist with the forearm fully extended. While traction is maintained the forearm should be slowly flexed. The manipulation should be slow and firm. Reduction sometimes fails because of extensive effusion. A delay of a few days to allow absorption of the effusion defeats its own object as the blood, when organized, causes a still more solid resistance and callus is formed very rapidly.

If the displacement cannot be corrected by non-operative means, open operation is indicated. The incision should be made in the midline on the posterior surface of the arm. No metal or other fixative should be inserted. In the after-fixation the elbow should be acutely flexed and the hand supine.

Complete anatomical reduction is necessary to prevent excessive callus formation which may obstruct movement at the elbow joint. The greater the displacement, the greater the amount of callus that will be formed.

During the after-treatment too great activity, either in massage or movement, increases the tendency to callus formation, but prolonged immobilization with the forearm in flexion is followed by pronounced rigidity of the elbow.

The author fixes the extremity in the flexed position, with the elbow region free or lightly covered. To relieve the pain and to aid absorption, the gentlest effleurage is applied to the elbow region from the first day. After a week or ten days the arm is released daily and slightly active motion is given, the arm then being replaced in the same splint. At the end of the third week the arm is placed in a sling and further voluntary movements are encouraged. Passive motion is to be avoided.

Following operative reduction the arm is left untouched until the tenth day, when the sutures are removed. After several days the same routine is followed as in the non-operative cases.

DANIEL H. LEVINTHAL, M.D.

Maffei, F.: Traumatic Dislocation of the Hip in the Child (Contributo allo studio della lussazione traumatica dell'anca nell' infanzia). *Chir. d. organi di movimento*, 1922, vi, 604.

Traumatic luxation of the hip is very rare in the young. Of 1,842 such lesions observed at the Rizzoli Institute of Bologna since 1901 only three were found in young persons. Two of the young patients were under 10 years and one was 14 years of age. All three had a luxation of the hip caused by a fall. Fractures of the neck of the femur are much more common in the young.

In the literature the author has been able to find only forty-nine cases of traumatic luxation of

the hip in the young. The most common type of luxation is the posterior luxation. This was of the iliac type in thirty-three cases and of the ischiatic type in six. The anterior luxations were of the suprapubic type in two cases, the iliopectoral type in one, and the obturator type in six. In one case record the type is not given. Thirty-seven of the patients were males, and eleven, females. In twenty-two cases the left hip was luxated and in seventeen the right hip. Ten case records do not state which hip was affected. Two of the author's three cases were posterior iliac luxations of the left hip and one was an anterior suprapubic luxation of the right hip. All were operatively reduced and cured.

Spontaneous reduction was effected in only one of the forty-nine cases. Manipulative reduction is usually easy if done soon after the injury. In old cases time should not be wasted in attempts at reduction.

With the technique which is used today there need be little fear of sepsis; in only three operative cases were there any septic complications. Whether the reduction is effected by manipulation or operation it should be maintained by means of a carefully moulded plaster cast. Failure is due principally to the use of traction apparatus which is not sufficient to maintain the limb in the desired position.

W. A. Brennan.

Epstein, G. I.: The Surgical Treatment of Habitual Dislocation of the Hip (Zur operativen Behandlung habitueller Hueftluxationen). *Nowy Chir. Arch.*, 1922, ii, 30.

The observation of a case in which, after resection of a tuberculous hip, hyperostosis occurred and resulted in the formation of a bony wall at the iliac acetabular roof which prevented upward dislocation of the femur, suggested imitation of the method indicated by nature by surgical measures. The method of preventing recurrence of dislocation of the head of the femur by cutting from the ilium a flap of bone with periosteum attached, deflecting it, and stitching it to the articular capsule was originated by Koenig, but the two children on whom Koenig operated died of intercurrent disease before a permanent result had been achieved.

The author reports the case of a boy, 16 years old, who was operated on by Polenoff. This patient suffered from paralytic dislocation of the left hip and showed other results of poliomyelitis which seriously affected walking. The gluteal muscles were paralyzed but the muscles of the thigh were better developed than those of the other side. Through a curved incision beginning two and one-half fingerbreadths behind the anterior-superior spine of the ilium and extending to the tip of the trochanter and by partial transverse division of all three gluteal muscles, the articular capsule was widely exposed and a section measuring 2.5 cm. was resected, invaginated in the neck portion, and sutured together again. A semicircular incision was then made in the periosteum of the ilium 4 cm. above the margin of the acetabulum, and a bony lamella shaped like a fan detached with its periosteal covering, deflected downward, and made fast to the capsule with three sutures. A roentgenogram made six months later showed that the artificially created protective roof was well established. There has been no recurrence of the dislocation.

von der Ceyen-Sacken (Z).

Kopits, J.: Deformity of the Head of the Femur as an Obstacle to the Complete Cure of Congenital Dislocation of the Hip (Die Deformierung der Hueftgelenkes des Femur als ein Hindernis der vollkommenen Heilung der kongenitalen Hueftgelenksluxation). *Orvosi hetil.*, 1922, lxvi, 201

Deformities at the proximal end of the femur are divided into the following groups: (1) congenital changes in the head, the neck, or the entire proximal end of the femur; (2) congenital deformities plus secondary changes which have developed from the use of the extremity affected by dislocation of the hip; (3) changes which have arisen in connection with the reduction, retention, and after-treatment of the head of the femur; (4) pathologic changes which arise in the reduced head of the femur in the course of treatment or after an apparently complete cure.

Following a discussion of the significance, the basis, the relations, and the origin of these deformities, the author draws these conclusions:

1. Congenital deformities and those arising secondarily before reduction, at an age when the head, otherwise normal, is still reducible—provided there is a concentric stratification in the joint socket—cause little or no disturbance in the function of the joint after reduction.

2. Deformities of the head which arise during treatment or as a result of after-treatment tend to be permanent. The functional success of the treatment is not complete; limping persists in some degree. Recognizing their causes, we must do all in our power to guard against the development of deformities. By more frequent changing of dressings we must inform ourselves in each case whether the articular capsule or the muscles have contracted sufficiently to allow us to terminate the period of fixation. When fixation has not been continued too long, there is no need of after-treatment to relieve contracture. There can be no set rules for all cases.

3. We cannot prevent a disturbance of bone formation in the femoral head, the development of an osteochondritis juvenilis. This process is of a progressive character and often leads to destruction of the joint (arthritis deformans juvenilis), but in other cases becomes stationary at a certain stage of development. Such destruction of the head is not directly connected with the congenital dislocation of the joint as it may be observed in joints which were normal at birth. For reasons still unknown, however, it is seen with remarkable frequency

in association with congenital dislocation. The disease process may begin during treatment or some time after it has been finished, but always before the end of puberty it disturbs the good result which had been regarded as secure. On the basis of these experiences we cannot regard reduction of the joint with good function as a permanent cure unless complete ossification of the epiphysis of the head of the femur has occurred.

VON LORMAYER (Z.)

SURGERY OF THE SPINAL COLUMN AND CORD

Frazier, C. H., and Spiller, W. G.: An Analysis of Fourteen Consecutive Cases of Spinal Cord Tumor. *J. Am. M. Ass.*, 1922, lxxix, 1924.

In twelve of the fourteen cases the tumor was accurately localized, accessible, well-encapsulated, and distinctly operable.

In thirteen cases pain was the first symptom and conspicuous. The original pain zone persists throughout the course of the disease, but in the later stages is more widespread in distribution. It is therefore an important localizing sign. In four cases pain was present for three or more years, and in three cases approximately two years elapsed before motor signs appeared.

According to the location of the tumor, the most common diagnostic errors are: pain associated with movements of the neck diagnosed as Pott's disease; pain referred to the shoulder diagnosed as rheumatism; pain referred to the shoulder and arm diagnosed as neuritis; pain referred to the precordium diagnosed as angina pectoris; pain referred to the upper abdomen diagnosed as due to gall-stones; pain referred to the lower abdomen diagnosed as appendicitis; and pain referred to the lower extremities diagnosed as sciatica.

Given a case with pain of definite localization which is aggravated by movement, coughing, or sneezing, and persists for months or longer in the original site with occasional remissions but without variation except in degree, the possibility of a spinal cord tumor must be borne in mind.

The distribution of pain and paræsthesia differ in that pain, a root phenomenon, is always referred to the same side as that of the lesion, while paræsthesia, a cord-pressure symptom, may be homolateral, contralateral, or bilateral.

In the classical description of the clinical course of spinal tumors three cycles are mentioned: the cycle of root pain, the Brown-Séquard cycle, and the cycle of motor and sensory paralysis. In not one of the fourteen cases was there a typical Brown-Séquard picture.

Motor disturbances were present in each of the fourteen cases in greater or less degree, according to the size and location of the tumor.

Spasticity is always a forerunner of weakness or paralysis and in most cases the difficulty in locomotion is due to the spasticity rather than atrophy.

The sequence of symptoms is pain, paræsthesia, and paralysis.

Too much stress must not be laid on the presence of a spinal block. This is a late rather than an early symptom. Xanthochromia was present in only five cases and its duration was five, three, and two years. The Queckenstedt or Ayer test for spinal block should be applied in all cases as it may reveal a block before xanthochromia appears. A positive finding by either method should be regarded as only confirmatory, however, since negative findings do not preclude the presence of a tumor and positive findings have been noted in cases of lesions other than tumors.

It is a matter of very little consequence, when once the segmental localization is established, whether the tumor is intradural or extradural or what its position is with relation to the spinal cord. In the cases reviewed there were no intramedullary growths.

Two of the patients died. In one of these cases two-thirds of the tumor was within the intracranial cavity, only one-half of the diaphram sustained the respiratory act, and a respiratory breakdown occurred during the operation. The other death was due to embolism.

To avoid making the opening in the spinal column too low it should be borne in mind that the level of the lowest lamina to be removed should correspond to the location of the segment representing the highest level of sensory loss.

To prevent recurrence the operator should remove with the tumor that portion of the meninges from which it originated. In the cases reviewed there was only one recurrence; a second operation was advised but not permitted.

Recovery of function is a matter over which the surgeon has no control. Assuming that the tumor was removed without injury to the cord, the return of function will depend on whether the symptoms were due to pressure or to cord degeneration; if to the former, functional recovery will be complete; if to the latter, it will be more or less limited. When the symptoms are due to pressure alone, sensory and motor function recover surprisingly promptly, even when the tumor was present for several years. Within a few days of the operation, first sensory and then motor function returns.

There were only two cases in the authors' series with absolutely no return of function.

The article contains several interesting illustrations.

CARL R. STEINER, M.D.

SURGERY OF THE NERVOUS SYSTEM

Sachs, E., and Malone, J. Y.: An Experimental Study of Methods for Bridging Nerve Defects, With a Description of a New Method of Auto-transplant (Auto-Autotransplant). *Arch. Surg.*, 1922, v, 514.

The authors have experimented in nerve repair on dogs to ascertain the best of three methods to employ when end-to-end anastomosis is impossible.

The most careful technique was used, including very gentle handling of the nerve, a bloodless field, the control of bleeding in the nerve by means of cotton pledgets soaked in warm saline solution or the injection of warm saline solution into the nerve, and the approximation of nerve tissue to nerve tissue.

Several methods of repair were used, but all except three were discontinued. The latter were as follows:

1. Anastomosis of the central and peripheral ends of the injured nerve into longitudinal incisions in a normal nerve. The freed cut-ends of the injured nerve were sewed carefully into longitudinal slits in a nearby nerve. In eighteen dogs the peroneal nerve was cut and then sutured into the tibial nerve.

2. Anastomosis of the central and peripheral ends of the injured nerve to flaps cut in the same quadrant of a normal nerve. The peroneal nerve was sutured to flaps in the tibial nerve in fifteen experiments.

3. Autotransplantation of half of the central end of the injured nerve, the segment removed being just long enough to bridge the defect (auto-autotransplant).

The nerves operated upon were exposed at various intervals and tested with electricity peripherally by the muscle contractions, and centrally by reflex stimulation of respiration.

The animals were finally killed and the nerves examined microscopically after being cut transversely into sections 5 to 10 microns thick or longitudinally. Every fifth section was mounted so that the nerve fibers could be traced systematically.

Other tissue than nerve tissue is unsatisfactory for bridging a nerve defect. The most successful method for large defects consists in implanting the nerve ends into an adjacent healthy nerve.

Hæmorrhage from a nerve may be controlled by distending the end of the nerve with salt solution.

Accurate approximation of cut nerve ends is essential for the best results. Fine silk causes far less reaction than catgut.

The conclusions drawn by the authors are summarized as follows:

1. Nerve fibers will grow down the trunk of a healthy nerve through a longitudinal incision without impairing function and some of the fibers will connect up with the peripheral end. It is therefore of advantage to implant both ends.

2. On account of the branching of regenerating fibers a sufficient number of axons are produced when a nerve is cut longitudinally to fill the sheaths in the implanted nerve, indicating that an end-to-side anastomosis would be satisfactory. This technique has been used successfully in faciohypoglossal anastomosis.

3. Malone's test to determine whether a nerve has crossed a line of suture is a valuable index of nerve regeneration.

4. Absolute alcohol may inhibit, but does not prevent, neuroma formation.

5. Accurate approximation is the most important factor determining nerve regeneration. Because of the presence of internal plexuses in nerves it is not so essential to maintain the original anatomical relation as was heretofore supposed. Whenever a nerve regenerates, whorls are formed at the regenerating end and consequently the central end of a fiber does not necessarily connect with its peripheral end.

6. The method of auto-autotransplants is to be preferred to cable transplants because no normal nerve need be injured and the operation can be performed in one field.

7. The double implantation method cannot be used if the nerve to be implanted is larger than the other nerve and if there is no adjacent nerve.

8. The second type of transplant has no advantages over the others.

9. The method of choice for bridging large defects is the double implantation method of anastomosis. Its advantage over the auto-autotransplant is that some fibers have only one suture line to traverse.

MARCUS HOBART, M.D.

Latarjet, A.: Resection of the Nerves of the Stomach; Operative Technique and Clinical Results (Résection des nerfs de l'estomac; technique opératoire; résultats cliniques). *Bull. Acad. de méd., Par.*, 1922, lxxxvii, 681.

The extrinsic nerves of the stomach constitute three groups. The group of the lesser curvature is composed of the gastric branches of the anterior and posterior vagi situated at the interior of the small omentum. The second or duodenopyloric group is constituted of filaments coming from the hepatic nerves which are situated chiefly to the right of the pyloric artery and approach the duodenopyloric canal in the upper part of its posterior surface. The third group is that of the greater curvature which is constituted of filaments coming from the cœliac plexus and is found only in the transverse segment of the stomach.

The author carried out experiments on dogs to study the effect of blocking the extrinsic nervous system of the stomach by section and of stimulating the pneumogastric or sympathetic branches.

From the point of view of motility the stomach may be divided into two distinct segments. The first is the vertical portion. Section of the nerves

of this segment diminishes tonicity, while electrical excitation of their peripheral ends causes a contraction ring which is not associated with peristalsis. The second motor section is the transverse part. Peripheral excitation of the nerves distributed here provokes peristalsis which is propagated to the pylorus.

Total blocking does not cause suppression of gastric movement. Section of the nerves causes an immediate vasodilation which does not extend to the gastric mucosa.

The anatomical and experimental findings have induced the author to try nerve section or resection of the gastric nerves in clinical cases in order to obtain: (1) a diminution of sensitiveness in the enervated territory; (2) diminution in the tonicity and frequency of gastric contractions; and (3) diminution of acidity. The technique of the resection of the various nerve groups is described. Such a resection was done in twenty-two cases, viz., six cases of tabetic gastric crises, six of gastric or juxtapyloric ulcers, and ten of gastropathies without any apparent lesion.

In the gastric crises of tabes the operation is less severe than other operations usually performed for the condition but has only a symptomatic effect, relieving pain and perhaps hypersecretion.

The value of the operation in the treatment of ulcer has not been determined. In all such cases the author supplemented it by a gastro-enterostomy. All of the patients were greatly benefited and may be considered cured but this result may be due to the combined operations.

Blocking of the nerves is indicated chiefly by gastropathies with symptoms indicating a disturbance of function but without any apparent lesion. Frequently in such cases gastro-enterostomy is ineffectual while nerve blocking is successful. Eight of ten cases operated upon in this manner were cured. One of the two other patients was tuberculous and had very severe gastric crises, and the other died from an influenzal complication. W. A. Brennan.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Primrose, A.: The Secondary Manifestations of Malignant Disease. *Ann. Surg.*, 1922, lxxvi, 312.

Secondary cancer metastasis occurs chiefly through the lymphatic channels and presents great variety. In bulk, the secondary tumor or tumors may exceed the primary.

Handley demonstrated continuous extension of cancer cells from the breast along the lymphatic channels to the glands of the axilla and the infraclavicular and supraclavicular regions, the pleura, the lungs, and the opposite breast, thence to the epigastrium and the navel by the lymphatics of the round and falciform ligaments to the liver, and thence to the peritoneal cavity.

Ewing states that for months or weeks the soil is prepared in lymph nodes draining a primary focus of carcinoma, the more recent changes consisting of moderate swelling of the gland, diffuse hyperplasia, catarrhal exfoliation of sinus endothelium, multiplication of follicles, and at a later period atrophy and fibrosis or fat invasion of the nodes. These changes he attributes to the absorption of autolytic and bacterial toxic products from the tumor.

On the other hand, carcinoma of the breast may be responsible in rare instances for distant metastases while the local lymph glands escape.

When a clinical diagnosis of a primary carcinoma has been made we must always assume the involvement of lymph glands even if there is no gross manifestation of the condition.

Involvement of the supraclavicular lymph glands at the root of the neck on the left side is most frequently observed in cases of cancer of the body of the stomach, the thoracic duct being the channel of invasion. Troisier first drew attention to these facts in 1886.

Abscess formation in connection with the secondary manifestations of malignant disease is due to the entrance of pyogenic organisms from an ulcerating surface. Primary carcinoma of the appendix is in some way connected with the development of tuberculosis, and may be wholly a manifestation of that pathologic process.

In cancer of the rectum and rectosigmoid, secondary metastases are found in the lymph glands and in the liver.

Sometimes a single lymph gland becomes the seat of a metastatic growth, the other nodes in the neighborhood showing no involvement whatever.

Implantation of carcinoma upon serous surfaces occurs with great frequency, especially within the serous sac of the peritoneum, as in general abdominal carcinomatosis. The implantation and dissemination of cancer during operative procedures is a danger which must be guarded against in operative technique.

The dissemination of malignant tumors may occur through the blood stream. This is characteristic of sarcomata because of the fact that these growths are closely associated with the blood vessels in their intimate histologic structure and their immediate surroundings. Malignant sarcomata of bone rapidly metastasize in the lungs, as do also those which occur in the kidney in young children. Many tumors, both simple and malignant, such as certain enchondromata and the hypernephroma first described by Grawitz, invade the blood vessels by direct continuity of growth.

Metastases in bone may form by direct spread from the primary growth or through the blood stream or lymphatics. Bone is destroyed at the site

of the growth and spontaneous fracture of a long bone may occur. In some cases the presence of the growth may not be suspected by the patient or the physician. MORRIS H. KAHN, M.D.

Mayo, C. H.: End-Results in Cancer as Influenced by Type, Reaction, Location, and Age. *Ann. Surg.*, 1922, lxxvi, 258.

A greater number of persons in this country are killed by cancer in one year than were killed in our two years of war. The disease is apparently increasing at a rate of about 2.5 per cent a year. It selects its victims from the mature and aged rather than from the young, the greatest mortality being between the ages of 40 and 60. Women are affected to a greater degree than men; the difference lies in the involvement of the organs of reproduction.

As a result of greater publicity regarding the disease and its destructive effects, persons with suspicious lesions consult the physician earlier, thus making it more possible to prevent or retard the development of cancer.

Environment and, apparently, acids due to degeneration or irritation contribute to the development of cancer. Pathologists and biologists have suggested many hypotheses. The views of these investigators seem to harmonize in the acceptance of regression or degeneration of the cells, loss of function, and proliferation as processes in cancer, and of irritation as a factor. Within the last few years a dissenting group of pathologists has asserted that it is not the functioning cell which starts cancer by degenerating or regressing, but the immature, waiting, or repair cells of the embryonic type.

While several factors, such as age, exhaustion of the cell, and loss of function or control, may have their place in the development of cancer, the chemical environment, however developed, is undoubtedly a most important stimulating force. The cells of youth are resistant to cancer, but if once affected, the softer tissue and better lymphatic and vascular circulation render growth and metastasis more serious.

From the clinical standpoint great progress is being made in attacking the cancer problem. A higher percentage of early operations, more radical operations, and marked progress in roentgen-ray and radium treatment account for the improved end-results.

The action of the roentgen and radium rays on the malignant cell is identical, provided the wave-lengths are equal. In the treatment of malignancy, especially in the cavities of the body, radiation therapy is most effective when radium is applied directly to the tumor and the roentgen ray applied to the possible regional and deep metastatic areas. The action of the ray causes a complex physiochemical change in which the cell becomes œdematous, the nuclear substance fragments, and finally all powers of cell regeneration are lost. The débris is then carried away by phagocytosis and replaced by connective tissue. When vascularity is one of the features of the condition, radium is most excellent. The end-result of both roentgen-ray and radium therapy is the development of fibrosis, which often changes the type of malignancy.

From the standpoint of the pathologist, most important advances have been made. The immediate frozen section gives a true picture of the disease without chemical or embalming changes of tissue. Resistance to the growth is shown by lymphatic infiltration and round-cell activity, which indicates the development of fibrosis. On the other hand there may be no evidence of fibrosis, but rather a very active cellular growth with proliferation, a most serious type, especially if operation is not performed before the lymphatics are involved. The probability of the cure of cancer can be largely foretold by the pathologist and depends in large measure upon the presence or absence of fibrosis.

In the Mayo Clinic the late results following operation for cancer have been found to tally very largely with the cell evidence.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Ten Broeck, C., and Bauer, J. H.: The Tetanus Bacillus as an Intestinal Saprophyte in Man. *J. Exper. M.*, 1922, xxxvi, 261.

It is a well-recognized fact that bacillus tetani is widely distributed in nature, but the rôle of man as a carrier of this organism has received little attention. In the literature it has been repeatedly stated that man may carry the tetanus bacillus in his digestive tract. The statement is based apparently in each instance on the work of some other investigator than the author of the article and on the fact that this hypothesis offers the best explanation for certain idiopathic cases of tetanus and the cases following typhoid fever, dysentery, and hæmorrhoid operations.

The case which first interested the authors was one in which the source of the infection seemed to be a fæcal contamination of a bed-sore. In this article they report the results of the examination of the fæces of seventy-eight persons and present evidence which seems to indicate that in some persons tetanus bacilli are normal inhabitants of the intestinal tract. With one exception, their examinations were made on the fæces of male Chinese who live in more intimate contact with the soil than the average European or American; therefore their findings may not be duplicated in the Occident.

It was often very difficult to obtain the organisms in pure culture though they were plated repeatedly. Accordingly it is evident that there are organisms which interfere with the production of tetanus toxin or destroy it and that the injection of mixed cultures is not a reliable method for the detection of tetanus bacilli.

The authors examined forty-three stools of patients in the hospital and obtained tetanus bacilli from eleven (11.6 per cent). A few months later

they examined thirty-five stools and isolated tetanus bacilli from sixteen (45.7 per cent). In all, they examined seventy-eight stools and obtained organisms which in their morphology and toxin-producing properties were tetanus bacilli from 34.7 per cent. While the results might indicate that carriers of tetanus bacilli are more numerous at certain seasons of the year, the authors believe that the higher percentage of positive cases in the last group examined by them was due to the fact that they were more expert in the examination.

They do not report the methods used in detecting the tetanus bacilli in mixed cultures, but state that the only reliable method is the isolation of the bacillus and the demonstration that the culture forms a spasm-producing toxin which is neutralized by tetanus antitoxin. The injection of mixed cultures gives uncertain results, for while tetanus bacilli may be present, other organisms may interfere with the production of toxin. From the results obtained it is concluded that man plays a large rôle in the distribution of the bacillus.

It is difficult to state just how these large numbers of tetanus carriers influence the case incidence of tetanus. The authors have been unable to obtain a record of tetanus following typhoid fever or dysentery, though these diseases are extremely common. They have seen one case of tetanus following a fall which ruptured the intestine but did not produce an external injury. It is evident, however, that foreign physicians in China see in adults very little tetanus due directly or indirectly to an intestinal infection.

While the authors have no accurate statistics, it is their belief that tetanus neonatorum is extremely common. One investigator, in questioning hospital patients as to their history, found that of 8,468 children born, 61 per cent died of convulsions or madness. It is quite probable that many of these deaths were due to tetanus, the infection coming from the filthy dressings used on the cord. The figures are only approximate but they give some indication of the great loss of life which is associated, at least in part, with the spreading of tetanus bacilli by man.

The following conclusions are drawn from the experiments:

1. The only reliable method for the detection of tetanus bacilli is the culturing of the suspected material, the isolation of tetanus-like organisms, and the demonstration that pure cultures form a spasm-producing toxin which is neutralized by tetanus antitoxin.

2. This method demonstrated tetanus bacilli in 34.7 per cent of stools from seventy-eight persons living in Pekin.

3. The tetanus bacillus may be present in the digestive tract of persons who have been on a practically sterile diet for a period of a month or more, and one person may eliminate several million spores of tetanus bacilli in a single stool.

GEORGE E. BEILBY, M.D.

ROENTGENOLOGY AND RADIUM THERAPY

Steinegger, A.: The New Roentgen Universal-Exposure Table of Fiedler (Neuer Roentgen Universal-Aufnahmetisch nach Fiedler). *Schweiz. med. Wchnschr.*, 1923, liii, 881.

The author recommends a table for the taking of X-ray plates which was designed by Fiedler, an engineer of Zurich, and is extremely useful because of its simplicity and adaptability. It is a solidly built table without a separate tube stand. Under its plate (canvas frame) of two parts which are easily movable in the longitudinal and transverse directions is the cabinet for the lower tube which is also movable in both directions and connected with the upper stand rod. In addition to the upper tube box with lead glass windows this has a pivoting arm which is movable up and down and carries a frame to hold the fluoroscope.

The apparatus can be used as a trochoscope; for exposures and transilluminations from below; for the accurate vertical centering of a part in the plate; for vertical and oblique exposures from above downward and accurate counter-exposure; for exposures and transilluminations of the standing patient; for two superimposed vertical exposures on the patient in the recumbent posture; for stereoscopic exposures with displacement and obliquity of the upper tube; and for the accurate localization of foreign bodies.

HOFFMANN (Z.)

Nichols, B. H.: The Roentgen Diagnosis of the More Important Tumors of the Long Bones. *Surg., Gynec. & Obst.*, 1922, xxxv, 301.

The first impression gained from the observation of a roentgenogram of a bone tumor is simply one of bone destruction, of bone production, or of both, but many other aspects should be considered also, such as the location of the tumor, the condition of the cortex of the bone, the age and sex of the patient, the invasion of the soft parts, the point of origin of the tumor, the character of the destruction, and whether there are single or multiple lesions. In order to interpret the value of these observations it is best to classify bone tumors into four major divisions according to: (1) whether they are of medullar or cortical origin; (2) whether or not they are characterized by bone production, by bone destruction, or both; (3) whether the cortex has been expanded or destroyed; and (4) whether the tumor is invasive or non-invasive. The various bone tumors belonging to one or more of these divisions are enumerated.

The pathologic characteristics of the more important bone tumors are given as follows:

Round-cell sarcoma is medullary in origin, contains no new bone, and causes marked destruction in all directions. It breaks through the cortex of the bone and invades the soft tissues. This tumor may be found anywhere in bone but is usually seen in the ends of the long bones. It will not cross a joint. It is unaccompanied by new-bone production, and occurs most often before the thirtieth year of age.

Spindle-cell sarcoma presents most of the characteristics of round-cell sarcoma, but is less invasive, the roentgenogram suggesting some limitation, especially in the medullary canal where a slightly denser area appears at the periphery of the growth. This tumor does not metastasize as readily as the round-cell sarcoma.

Periosteal sarcoma is characterized by new-bone production laid down in striæ which are perpendicular to the shaft. The deposit of new bone is entirely in the soft tissues and does not reach the bone proper. The cortex may be destroyed later in the disease. This tumor is seen most often before the thirtieth year of age and, like all malignant tumors, is invasive.

Osteosarcoma is usually cortical in origin. Bone production is pronounced. As in periosteal sarcoma, the new bone is deposited in striæ perpendicular to the shaft but, unlike the latter, is found within the tumor as well as in the invaded soft tissues. In general, the degree of malignancy may be determined to a considerable extent by the amount of new-bone formation; the more malignant the type the more rapid the growth and the more limited the bone formation. Bone destruction is seen early; the cortex is destroyed and the medullary canal invaded.

Bone carcinoma is always metastatic and of medullary origin. As a rule it is seen at the middle of the bone at the nutrient foramen. There is only bone destruction, no bone production. The tumor never involves a joint and is seldom found below the elbows or knees. It is essentially a disease of the later period of life.

Myeloma is a true bone tumor. Several tumors of this type may occur simultaneously at different locations in the osseous system. They are always medullary in origin. They give first the appearance of expansion and later of destruction of the cortex.

Giant-cell sarcoma is classified with the benign tumors. It is usually medullary in origin and found in the ends of long bones. It does not produce new bone in its growth, but shows marked bone destruction. The cortex is intact, but expanded. The growth is multilocular, usually occurs after middle life, and does not metastasize.

Bone cysts are medullary in origin and produce marked bone destruction. They tend to extend up and down the medullary canal, expanding, and at the same time, thinning out, the cortex, so that they present a cylindrical contour and often cause pathologic fracture. They are usually multilocular, are found in the ends of long bones, and occur in early life. According to the author's experience, they are always single.

Fibromata destroy bone, are medullary in origin, and occur as single tumors. They thin out the cortex but do not destroy it. No new bone is formed, and the cortex does not expand. The tumors show one single area of destruction and are not multilocular.

Chondro-osteoma and osteochondroma present either a preponderance of cartilage over bone or of bone over cartilage. They are either medullary or cortical in origin. They produce bone destruction with expansion of the cortex so that a cylindrical tumor results. They are usually multiple. Both bone destruction and bone production are present.

Osteomata are cortical in origin and show marked bone production without bone destruction. They extend directly from the shaft or the body of the bone. They do not invade the tissues but push them aside.

Exostoses are bony growths from the cortex extending out from the body of the bone and pointing away from the nearest epiphysis. They are long and narrow and may have an osteoma on the end.

Brief descriptions are given also of such conditions as ossifying hæmatomata, myositis ossificans, tuberculosis of bone, syphilis, and other types of osteomyelitis in which the roentgen picture may suggest a bone tumor. Points differentiating them from the tumors they resemble are enumerated.

ADOLPH HARTUNG, M.D.

Crane, A. W.: The Roentgenological Aspects of Achylia Gastrica. *Am. J. Roentgenol.*, 1922, n.s. ix, 527.

The material which forms the basis of the author's study was approximately 1,000 cases in which, with few exceptions, the stomach contents were obtained in five or six fractions at fifteen-minute intervals, beginning one-half hour after an Ewald test meal.

The importance of achylia gastrica to the roentgenologist lies in: (1) its frequency in cases of gastro-intestinal pathology; (2) its association with abdominal pain; (3) its association with intestinal disturbances; and (4) its influence on the interpretation of roentgen-ray signs.

As regards the frequency of achylia gastrica Crane states that it was found in 12.6 per cent of the entire series of cases. In none of these cases was ulcer diagnosticated or found later by examination or at operation or autopsy. The author grants that the two conditions may occur simultaneously but he believes that this is exceedingly rare.

Pain was frequently associated with achylia but its source was often difficult to find and sometimes inexplicable. In many of the cases it was traceable to associated lesions such as gastric cancer, gastric syphilis, gall-bladder pathology, pericolic adhesions, mucous colitis, or spondylitis deformans. The diversity of causes of pain and the number of cases of achylia without pain suggest that the achylia itself may not be responsible.

The association of achylia with diarrhœa has been emphasized by various authors. In Crane's series of 158 cases diarrhœa was present in twelve. Mucous colitis was found only twice. The rapid expulsion of the barium meal with intestinal hypermotility may thus find a rational explanation if the roentgenologist is enabled to interpret his roentgen-ray findings in conjunction with the laboratory sheet.

The difference in the interpretation of the roentgen-ray signs according to whether achylia is present or absent is most strikingly illustrated in cases with

the syndrome of duodenal ulcer. The duodenal ulcer and the achylia type of gastric peristalsis may often be indistinguishable. Very commonly four or five peristaltic contractions may be simultaneous. This, in connection with the rapid expulsion of stomach contents and the often incomplete filling of the duodenal bulb due to the rapid passage of the barium, may appear to give the syndrome and the bulbar deformity of ulcer of the duodenum. If the stomach contents show a total absence of free hydrochloric acid, the roentgenologist should never make the diagnosis of duodenal ulcer without doubly proving the persistence of a characteristic deformity of the duodenal bulb and then excluding adhesions, pressure, and reflex spasm as causes of the deformity.

Gastric cancer and gastric syphilis may both be associated with achylia, the roentgen signs being indistinguishable. Pernicious anaemia and cancer may show a striking similarity in the blood picture, and both may be associated with abdominal pain, weakness, and achylia, but a knowledge of the achylia type of gastric peristalsis will very effectively confirm the absence of a filling defect and give added assurance to the roentgen ray interpretation.

In conclusion the author states that achylia is associated with such an extraordinary range of pathologic conditions that conclusions regarding it must be based only on very large series of cases. Because of the frequency of achylia in persons over 50 years of age it is probably confused with many pathologic conditions not related to it. The author therefore claims nothing for his figures except that they show in a general way his personal experience regarding the roentgenological aspects of this interesting secretory disorder of the stomach.

ADOLPH HARTUNG, M.D.

Delherm, Laquerrière, and Morel-Kahn: A New Method for the Roentgenological Exploration of the Kidney—Pneumoperinephros (Sur un nouveau procédé d'exploration radiologique du rein, le *pneumopérinéphros*). *J. de radiol. et d'électrol.*, 1922, vi, 589.

The authors refer to the method of pneumo-kidney introduced by Carelli and Sordelli of Buenos Aires in 1921. This method has lost favor because many who tried it did not obtain the results reported by its originators or met with accidents in its use. The authors, however, have used it successfully, with slight modifications, in more than sixty cases. They insert the needle over the second lumbar process as in the original method but direct it more outward and downward. It thus traverses the thick transverso-costal ligament of Henle and is kept away from the mediastinum and the fatty cellular tissue surrounding the arteries and veins. Oxygen or carbon dioxide is then injected. From 300 to 350 c.cm. of oxygen is sufficient but a greater quantity of carbon dioxide is necessary.

The authors report eight typical cases of pneumoperinephros exploration. The method is indicated when the classical methods of exploring the kidney region have failed, and is of great value when there is close co-operation between physician, surgeon, pathologist, and roentgenologist. W. A. FRENNAN.

Rothbart, L.: The Treatment of Frostbite with the Roentgen Ray (Kosmetischer Beitrag zur Roentgenbehandlung der Frostbeulen). *Fortschr. a. d. Geb. d. Roentgenstr.*, 1922, xxix, 356.

The treatment of frostbite with the roentgen ray was reported in the German literature during the early years of the war, but was later forgotten. Holzknecht speaks of a long-continued effect on the blood vessels. This must be due to direct action on the vasomotor system or indirect action on the circulation through an increase in the internal secretory activity of the connective tissue.

In twenty-six of twenty-seven cases treated by Rothbart a subjective or objective cure, or at least great improvement, was obtained. The hard therapeutic ray is filtered through 1 or 2 mm. of aluminium. According to Holzknecht, prophylactic irradiation given in the autumn will prevent the development of chilblains during the winter.

WOHLAUER (Z).

Case, J. T.: Technical and Clinical Aspects of the New Deep Roentgenotherapy. *Am. J. Roentgenol.*, 1922, n.s. ix, 530.

The term "new" deep roentgenotherapy refers more particularly to the application of shorter wave-length radiation. It is further justified by the wealth of new information concerning the physical and biological factors underlying the principles of therapeutic roentgen-ray applications, especially the behavior of scattered radiation, which for the first time in the history of roentgenology permits the assurance of a reasonable degree of precision in dosage. Emphasis is laid upon the necessity of knowing the approximate wave-length of the rays available, of understanding the rationale of filtration, choice of size and number of fields, and the target-skin distance from which the application is made. It is assumed that there is agreement as to the rationality of employing a combination of radium and roentgen-ray therapy wherever the situation of the pathologic lesion makes this possible. Only the treatment of malignancy is considered at any length in this article.

As regards the selection of cases for deep therapy, it is probably wise to exclude, at least for the present, those patients whose malignancy has progressed to the stage of advanced cachexia and utter hopelessness, with extensive metastases in the bones, the liver, or the lungs. In such cases the application of the massive doses involved in the new method would very probably hasten the inevitable, and thus tend to bring unfair discredit upon the radiologist. As regards distinctly operable cases, the author holds with the majority that the treatment of choice is operation combined with such radiation as may seem appropriate. In his estimation, pre-operative radiation is of even greater importance than post-

operative, the irradiated cells being in such degree and manner influenced by this treatment that there is certainly less danger of transplantation during the surgical interference.

Preparation is just as advisable when deep roentgentherapy is to be administered in massive doses at a single séance as when a major surgical procedure is to be followed. Preliminary rest in bed, attention to eliminative processes, dietary regulation, blood and urine examinations, and even a blood transfusion (if it is the type of case in which such a procedure would be considered before a surgical operation) are essential. Plenty of fluid should be administered by mouth, and if necessary, by enema or intravenous injection. Lactose or glucose with alkalies may be added to the liquid to advantage. The patient should come to the treatment room with an empty stomach. Morphine administered hypodermically just previously lessens the tendency to nausea and vomiting and quiets the patient during the tedious and often uncomfortable treatment.

Before beginning the radiation a definite plan should be worked out so that all parts of the lesion may be given the desired amount through the most suitable ports of entry. Charts prepared by Dessauer and by Holfelder present the best available means of planning the fields and the percentage of the skin erythema dose to be administered through each one. The principles of "carcinoma" or "sarcoma" doses as laid down by Seitz and Wintz are considered by the author as the best basis of procedure. The object of attack is to deliver to the zone under fire approximately 120 per cent of a skin erythema dose for carcinoma, and 70 per cent of the skin dose for sarcoma, this dose to consist of homogeneous radiation equally distributed at one sitting to all the pathologic or suspected tissues. In the author's practice, the dose is seldom delivered in one day, but more often is given within two or three consecutive days, with an added day for the radium application.

As regards the technique of application, Case states that in the treatment of uterine carcinoma four areas are irradiated in addition to the intrauterine and vaginal radium treatment. The proportion of the skin erythema dose given through each of the four portals of roentgen-ray treatment depends upon the distribution of the lesion and the external measurements of the pelvis. A filter of 1 mm. of copper is used. In pelvic work a target-skin distance of 50 cm. is maintained. For the treatment of breast, neck, jaw, and face malignancy a target-skin distance of 75 cm. is preferable to a shorter distance. With the author's technique it requires 800 ma. minutes, working at 200 kv., with 8 ma. through the tube, at a 50-cm. target-skin distance, with the filter and fields mentioned, to produce a mild erythema on the skin of the neck. It is important to complete the introduction of the entire dose within the shortest reasonable time. There is little likelihood of accomplishing as much toward the destruction of the disease at any subsequent attack as at the first one. The techniques employed at Freiburg and at Erlangen are described at some length.

Although the dosage may be checked up by some method of ionometry, the individual installation under the peculiar working conditions of each laboratory will become standardized, and chief dependence will be placed on the reproduction of the six physical factors (voltage, milliamperage through the tube, time of application, filter, target-skin distance, and size of field of entry) rather than upon the electroscopic readings.

As regards the protection of the patient, Case states that the tube enclosure is not considered sufficient. The patient is covered with protective material except for the opening through which he is being treated. Lead or lead-rubber is used and is grounded.

Among the immediate effects of treatment, nausea and vomiting were frequently noted. When glands of the neck, axilla, or groin were treated, swelling and reddening of the area promptly followed but the swelling disappeared in from twelve to twenty-four hours. In general, a primary blush or reddening of the skin was noted which lasted one or two days and was followed in a week or ten days by the deeper reddening of the erythema dose. The reddening gradually faded and was subsequently replaced by a brown discoloration of the skin. Following intensive radiation to the chest or neck, patients frequently complained of temporary dysphagia, dyspnœa, a dry cough, disturbance of the voice at times approaching aphonia, pharyngeal irritation simulating pharyngitis or tonsillitis, and œdematous reddening of the uvula, pillars, and pharynx, but these conditions usually passed away in four to ten days.

The author has not observed any permanent deleterious effect upon the blood count resulting from the massive doses. Only slight temporary changes in the red and white counts were noted. In a limited number of observations the blood sugar was moderately lowered and the blood nitrogen slightly elevated. No marked constant change in the coagulation time of the blood was observed. The diminished blood sugar can be explained easily by the lessened alimentary intake during and immediately following the treatment.

Rectal and bladder tenesmus were fairly constant sequelæ of pelvic irradiation in massive doses. The daily bowel movements begin to increase in number on about the third day, reaching ten to fifteen in twenty-four hours by the eighth or ninth day and then gradually returning to normal at about the same rate.

Roentgen intoxication is one of the less serious complications of the newer deep therapy, though it stands out as one of the most disturbing to the patient. Headache, nausea, vomiting, and weakness are fairly common but fortunately are transient, usually disappearing within forty-eight hours.

When repeated treatments are indicated they should be separated by an interval of from six to

twelve weeks. In no instance were more than three massive applications given. In several of the cases a herpetiform skin eruption followed the treatment within a week or two but no late damage of the skin was noted in any instance.

The immediate effect upon the disease has been very encouraging. In a given series of consecutive cases (excluding those in which cachexia was present) the occurrence of prompt improvement was relatively increased. Pain was usually relieved, bloody and purulent discharges were decreased or disappeared, and the general condition was improved. While some cases responded no better than before, it is generally agreed that palliation appeared more promptly in a large percentage. In a few, the visible evidences of the disease disappeared. German roentgenologists, who have been giving this treatment for four or five years, have small series of patients now alive three years after such treatment given with what they considered nearly ideal technique.

In conclusion the author states that the reports of clinical results by European roentgenologists should be accepted with considerable reserve, but the enormous fund of information concerning the physical and biological basis of deep therapy furnished by them and by American investigators, which will permit most intelligent use of the shorter wavelength roentgen radiation, should be gratefully welcomed. A definite advance has been made in deep radiotherapy. Unprecedented good results of at least temporary duration are being obtained more constantly in a larger percentage of cases. Radium therapy will be more than ever successful in gynecological malignancy when combined with the intelligent application of the new, more penetrating roentgen rays which, by their adaptability to conversion into practically homogeneous radiation, will supplement the internal use of radium to reach the lymphatic lines along which extension of the malignant disease occurs. ADOLPH HARTUNG, M.D.

Martin, C. L., and Uhler, C.: Roentgenotherapy of the Intracranial Passages Following Spinal Air Injections. *Am. J. Roentgenol.*, 1922, n. s. ix, 543.

As more accurate methods for the diagnosis of intracranial disease are urgently needed, every reasonably safe procedure should be given a fair trial. The injection of air into the subarachnoid space and ventricular system as advocated by Dandy offers wonderful possibilities. The authors have had the opportunity to examine fourteen cases in this manner during the past year. On the whole, their results have been very satisfactory and they have had no mishaps.

The technique used was essentially that recommended by Dandy. The examination causes discomfort, but the information obtained often far outweighs the importance of the symptoms produced. Headache followed each injection. At times it was quite severe but it always disappeared within twenty-four hours. In a few cases pain developed in the back or in a leg during the injection, possibly because nerve filaments became caught in the needle. This pain also was usually transient. Eight of the patients remained in the hospital for twenty-four hours or longer and their pulse and temperatures were charted. A variable rise of temperature was noted which probably had some relation to a disturbance in pressure on the heat center. No attempt was made to study the absorption of the injected air except in one case. In this instance a small amount remained in the lateral ventricles at the end of six days, but none of the other injected structures could be made out.

The most important contra-indication to the method is a brain tumor in the posterior fossa. When there is any question regarding the presence of such a condition, a ventricular puncture should be done first through a small trephine opening to equalize the pressure on the two sides of the medulla. Infections and hæmorrhagic conditions have also been mentioned as contra-indications. The method appears to be of the greatest value in the study of cases of hydrocephalus in which it is of importance definitely to locate the point of obstruction.

To facilitate the study of the details of the intracranial passages a description of the cerebrospinal fluid circulatory system is given and several roentgenograms of normal brains are discussed. If an obstruction occurs in one of the narrow passages, that is, in the aqueduct of Sylvius or the foramina of Luschka and Magendie, a dilatation of the third and lateral ventricles results from back-pressure. This condition is called internal hydrocephalus. If the obstruction occurs in the basilar cisterns or the branches of the cerebral sulci, as often happens following meningitis, a dilatation of all the ventricles is apt to occur, a condition designated as communicating hydrocephalus.

It is Dandy's opinion that normal sulci always fill, and that the absence of such filling indicates a blocking of either the basilar cisterns or the sulci themselves. In the authors' series of fourteen cases the sulci were well filled only four times, whereas the ventricles were filled ten times. In four cases there was questionable filling of a few of the sulci. Since the ventricles appeared normal in most of the cases in which the sulci did not fill, hydrocephalus was probably absent. They do not feel, therefore, that a failure of the sulci to fill always indicates a blocking of these structures.

Several cases in the series were considered definitely pathologic. Three of these are cited briefly together with their roentgenograms. Case 1, that of a child of 3 years, was considered a case of hydrocephalus of the communicating type. It seemed possible that there was a blocking in the basilar cisterns, possibly due to meningitis. Case 2 was a similar case, that of a man of 31 years. The condition was probably the result of meningitis causing occlusion of a large number of sulci. In the third case a clinical diagnosis of midbrain tumor, probably arising in the quadrigeminal bodies, was made. The

roentgenogram suggested an obstruction in the aqueduct of Sylvius.

In conclusion, the following summary is appended:

Injection of the subarachnoid space with air appears to be a relatively safe procedure when the cases are properly selected. The after-effects of the injection are not serious. The proper interpretation of roentgenograms of the skull made following such injections should aid materially in improving the mortality statistics of brain surgery.

ADOLPH HARTUNG, M.D.

Sampson, C. M.: The Ultraviolet and X-Ray as Physiological Complements in Therapeusis: A Newly Established Clinical Treatment. *Am. J. Roentgenol.*, 1922, n.s. ix, 570.

About three years ago the author began clinical experimentation with a view to increasing skin tolerance to the X-ray and finding some method to prevent or overcome the undesirable sequelæ of massive dosage. Proof as to how ultraviolet light antidotes any of these effects or may operate in breaking up the cycle of changes following massive dosage could be given only clinically even if our knowledge of the action of the actinic rays were very much more exact.

By means of rapidly repeated erythema doses of the actinic ray an area of skin may soon be brought to such a condition that about fifty times the original dermatitis dose of this ray will be necessary to produce even the mildest erythema. This increased tolerance of the skin is not confined to the action of the actinic rays alone, but includes also, to a less degree, the roentgen rays. Whether it is due solely to the tanning produced or to a decrease in irritability due to the repeated inflammatory reactions, or whether the blood-chemistry changes following the application of the ultraviolet light have an antidoting or damping effect upon the cycle of tissue changes set up by massive roentgen-ray dosage, cannot be stated. Clinical evidence seems to show that all three factors have a part. Surfaces tanned gradually by exposure to sunlight or weak applications of the actinic rays not causing noticeable erythema show a slightly increased tolerance to roentgen-ray dosage, but this increase is much less than that caused by repeated heavy erythemas rapidly produced by the quartz mercury burner. Increased tolerance seems to follow whether the surface tans or not, but possibly is not as great when tanning does not occur.

The conjoint use of the ultraviolet and the roentgen ray was suggested to the author by a comparative study of their local and general effects and by the ease with which a beginning roentgen-ray dermatitis could be cut short and, clinically at least, cleared up by vigorous actinotherapy. Although he was cautioned by prominent roentgen therapists against superimposing an actinic erythema upon a skin that had already received a dermatitis dose of the roentgen rays, he has been doing it for a number of years without causing a single depilation or symptoms which would indicate that a dermatitis had occurred, and has greatly exceeded dosages which, before the use of this method, produced dermatitis regularly. These well-meant cautions, however, caused him to treat a few hopeless cases first and wait for months before increasing the dosage proved safe in those cases.

The technique consists in preparing the skin area to be treated by the roentgen rays by a series of actinic-ray erythemas produced in rapid succession and repeated until heavy tanning takes place or, in case the subject does not tan, for approximately four weeks, general ultraviolet radiations (not necessarily so severe, but as strong as comfort will allow) being given at the same time for the constitutional effect. When it is decided that the area is prepared sufficiently, the last actinic erythema is allowed to fade out and the roentgen-ray treatment then given. On the same day, but after the roentgen-ray treatment, at least as much ultraviolet radiation is applied to the area treated with the roentgen rays as was given at the last previous ultraviolet treatment. The general ultraviolet exposures are also kept up. The application of the ultraviolet ray is repeated in the same or slightly increased dosage over the roentgen-treated area about every forty-eight or seventy-two hours, as indicated by the actinic reaction, until that area has had at least three good actinic exposures. Then all actinic erythema is allowed to die out so that if a roentgen erythema appears later it can be detected. In practice, a small central area is covered after two or three actinic treatments, and the ultraviolet-ray applications are applied to all the rest of the area for a period of three weeks, the small covered area being used as a control for the roentgen-ray erythema.

Several cases are cited in detail in which the treatment described was used with good effect. Massive doses in excess of ordinary erythema doses were given without the production of an erythema.

In conclusion the author states that the chief purpose of this clinical research was to point out that ultraviolet and roentgen-ray radiations are physiological complements. The one may be used in symbiosis with the other. That is, the ultraviolet ray applied first renders the area more resistant to subsequent radiation with the roentgen ray. The roentgen rays applied first may produce a dermatological change injurious to the organism, but the effects of that injury can be alleviated or entirely neutralized by applying ultraviolet radiation secondarily. The ultraviolet ray therefore greatly extends the previous limits of roentgen-ray efficacy in the treatment of disease. ADOLPH HARTUNG, M.D.

Pendergrass, E. P., Hayman, J. M., Jr., Houser, K. M., and Rambo, V. C.: The Effect of Radium on the Normal Tissues of the Brain and Spinal Cord of Dogs, and Its Therapeutic Application. *Am. J. Roentgenol.*, 1922, n. s. ix, 553.

The authors describe at some length the experimental work done by others to determine the effects

of radium upon the tissues of the central nervous system. They report also their own experiments upon dogs, in which they used both surface applications and implantation and noted the clinical symptoms, gross effects, and microscopic pictures produced by various doses applied to the brain and spinal cord. Consideration is given to the general effects of radium, the manifest toxæmia, and finally to certain findings which may throw light on the nature of the general effects observed.

The results of their experiments are summarized as follows:

1. An exposure of the normal brain tissue up to 1,150 mgm.-hrs. is compatible with life (surface application).

2. The results on the cord, however, would indicate that vital areas of the brain as well as of the cord should never be exposed to surface application or implantation.

3. Microscopic studies indicate that considerable change is to be found with exposures that cause no clinical symptoms.

4. After exposure of 1,000 mgm.-hrs. the brain shows a general swelling throughout the entire radiated hemisphere. This must be ascribed to the production of an œdema which is not limited to the radiated area, but extends throughout the entire hemisphere.

5. Radiation of the brain with radium (surface application and implantation) may cause severe general symptoms which indicate that a powerful toxin has been formed from the radiated tissue.

6. The effect of radium is due to a two-fold action: an effect upon the nucleus and cytoplasm of the cell and the resultant death of the cell under conditions favoring autolysis. The direction of this autolysis is determined by the chief component of the radiated cells. If this is protein, the toxic products of proteolysis may exhibit their general effect. If the chief component is lipoid compounds, the resultant autolysis may free the toxic components of lecithin and produce their characteristic reactions.

7. The use of radium is recommended for the treatment of brain tumors but should be undertaken only by one who is thoroughly familiar with the dangers that may result from its improper use.

8. The findings of the experiments on dogs are applicable to human beings since it is not the destruction of brain tissue that causes death, but some toxæmia. In the application of radium to the treatment of malignant tumors of the brain of man the normal brain tissue should not receive more than 1,150 mgm.-hrs.

In conclusion the authors state that radium is to be recommended as a prophylactic against recurrence following the removal of a brain tumor and after sella decompression, and as an active agent in the treatment of cases of recurrent visual disturbances following sella decompression. In cases of inoperable tumors it gives good results when implanted into the growth and supplemented by crossfire radiation through the scalp (external application). When a brain tumor is only partially removed, it should be implanted in the center of the cavity and supplemented by external crossfire radiation. When a brain tumor cannot be localized or discovered by operation radium may be used for external crossfire radiation. The treatment of spinal-cord tumors should be restricted to crossfire radiation by the roentgen ray or radium, as in surface application there is great danger of causing paralysis.

ADOLPH HARTUNG, M.D.

GYNECOLOGY

UTERUS

Arnold, C. G.: Uterine Prolapse with Associated Pelvic Relaxation. *Kentucky M. J.*, 1922, xx, 593.

The uterus lies in mobile equilibrium between the bladder and the rectum, the cervix being about 1 in. from the union of the second and third sacral vertebræ, and the fundus toward the symphysis with its axis at about right angles to the vagina. The ligaments are usually lax and merely limit the range of mobility.

To correct uterine prolapse fix the upper end of the vagina and the cervix in the proper position, hold the fundus forward, and give sufficient perineal support. If a large cystocele is present the interposition operation is best. When there is complete prolapse, the vaginal hysterectomy of C. H. Mayo with overlapping of the ligaments beneath the bladder and a high perineorrhaphy is indicated.

R. E. Christie, M.D.

Vogt.: The Significance of Aneurisms of the Uterine Vessels As Indicated by an Arteriovenous Aneurism of the Uterine Artery and Vein Due to an Aerial Bomb Injury (Ueber die Bedeutung des Aneurysmas der Uteringefaesse nach der Beobachtung eines Aneurysma arteriosum der Arteria und Vena uterina infolge Fliegerbombenverletzung). *Arch. f. Gynaek.*, 1922, cxvi, 129.

Aneurisms of the pelvic vessels are very rare, and no cases of aneurism of the uterine vessels have been reported in the literature. In the author's case a swelling as large as a hen's egg was palpable to the left of the uterus. Its median portion pulsated synchronously with the heart beat and caused bulging of the anterior vaginal vault. The lateral portion, which extended up the pelvic wall, showed no pulsation. Following compression, both portions of the tumor soon refilled. Friction and a hum over the tumor were noted on palpation and auscultation and the same bruit was audible over the femoral and common iliac arteries up to the aorta. Complications to be feared were an increase in size of the aneurism, compression and erosion of adjacent parts (particularly the ureter), adhesions, rupture of the aneurism with resultant severe hæmorrhage, malignant degeneration of a latent infection, and embolism.

A prophylactic dose of tetanus antitoxin was given previous to the laparotomy. The operation, which was done under lumbar anæsthesia, consisted in exposure of the left ureter throughout its entire pelvic course, ligation of the uterine artery close to its derivation from the hypogastric artery, total extirpation, and drainage of the cul-de-sac of Douglas through the vagina. The roentgenogram of the specimen revealed a fragment of the bomb in the uterus and another in the immediate vicinity of the aneurism. The latter had particularly sharp edges.

The author states that evidently the bomb fragment entered the pelvis through the greater sciatic foramen. Following adhesion of the vessels injured by its passage the intima grew over the wound, a fistulous connection between the artery and vein being thus formed.

In the differential diagnosis hæmatoma of the broad ligament, palpable pulsation of the uterine artery in retro-uterine hæmatocele, and cysts of Gartner's ducts with apparent pulsation must be taken into consideration. Gragert (Z).

Polak, J. O., Mittell, E. A., and McGrath, A. B.: What Is the Relation of Hypertension to Fibroid Disease of the Uterus? *Am. J. Obst. & Gynec.*, 1922, iv, 227.

The authors reach the following conclusions on the basis of 416 cases:

1. The presence of fibroids of the uterus in young women causes no apparent effect on the blood pressure.

2. Women with myomata who have a high pressure are usually over 40 years old, near the time of the climacteric, or have renal or cardiovascular disease.

3. The bleeding of fibroids seems to be salutary and has no direct effect on the blood pressure, but when it is suddenly checked by operation or radium the pressure rises temporarily.

4. In women of 40 years or over the pressure is raised for a varying period following removal of the uterus and ovaries, but unless there is some intercurrent disease, it soon returns to the pre-operative level.

5. When the ovary or ovaries are preserved the operative climacteric is less stormy.

6. The pressure and nervous phenomena are more pronounced after radium treatment than after operation. E. L. Cornell, M.D.

Von Ortenberg, H.: The Indications for Total Ablation in Certain Cases of Rupture of the Uterus (Ueber die Indikation zur Totalexstirpation bei Uterusruptur in besonderen Faellen). *Zentralbl. f. Gynaek.*, 1922, xlvi, 1070.

A sextipara in the fifth month of pregnancy noticed a discharge of amniotic fluid without external cause. A few days later a midwife introduced her hand "to remove the dead child." With the exercise of considerable force she finally delivered the trunk and limbs of the fœtus. The head and placenta she was unable to find.

At examination at the hospital the external os could be penetrated with two fingers, about 1 cm. above the os on the right side a large wound cavity was found. The uterus was empty, twice the size of a man's fist, and soft.

Laparotomy, performed at once, revealed on the right side, near the uterus, a tumor like bulging of the broad ligament. The peritoneum was intact. Total ablation was done; the head of the fœtus and the placenta were found between the folds of the broad ligament. Drainage was established through the vagina, the surface of the wound covered with peritoneum, and the abdomen sutured. Death occurred from cardiac weakness four days after the operation. There was no infection of the abdominal cavity.

Total ablation of the uterus is indicated not only when there has been an injury of the peritoneum but also when there are large rents in the broad ligament with severe hæmorrhage and expulsion of the uterine contents. WOHLGEMUTH (Z).

Tuffier: Irradiation and Enucleation of Uterine Fibromata (Traitement des fibromes: irradiation and énucleation). *Bull. Acad. de méd.*, Par., 1922, lxxxvii, 509.

In Tuffier's opinion, the indications for conservative operative treatment of uterine fibromata (enucleation) are more numerous than those for irradiation treatment. The principal arguments for this view are: (1) that a very large percentage of the women with fibroids are at the age of greatest sexual activity and radiation would cause sterility, and (2) a large number of fibromata are small. Recurrence following enucleation is amenable to irradiation without re-operation and in the meantime sexual function is preserved.

With a good technique, enucleation is no more dangerous than hysterectomy. Irradiation of uterine myomata should be employed only when otherwise a hysterectomy would be necessary.

W. A. BRENNAN.

Davis, L.: The End-Results of the Surgical Treatment of Carcinoma of the Cervix Uteri. *Ann. Surg.*, 1922, lxxvi, 395.

Many surgeons have become so enthusiastic in the use of radium in cases of cancer of the cervix that they have entirely abandoned the radical operation. It is the author's contention that, for the present, the operative treatment must still be regarded as the method of choice when it is possible because of its proven curative value and because we have not yet sufficient evidence that radium will give a lasting cure.

In a report published in 1920 of thirty-five cases of radical hysterectomy, twenty-six from the records of the Massachusetts General Hospital, the mortality was given as 11.6 per cent and the five-year "cures" as 37 per cent.

The author reports thirty-two additional cases in which a radical hysterectomy was done. These cases were chosen from eighty-five cases of carcinoma of the cervix examined. The operability was therefore 37.6 per cent. Twenty of these cases were operated upon prior to 1917, and twelve since then. The mortality was 9.3 per cent. The five-year cures averaged 40 per cent.

The radical operation consisted of wide removal of parametrial tissue and a liberal cuff of vaginal wall. In some cases curettage and cauterization were done ten days previously.

Cases presenting contra-indications to operation are those showing infiltration of the rectal or vesical walls, massive infiltration of the broad ligaments, or systemic contra-indications such as obesity, diabetes, or cardiac or pulmonary disease.

The most frequent complication in the cases reported was urinary fistula.

The twenty cases which were operated upon prior to 1917 are reported in detail.

I. E. BISHKOW, M.D.

Meigs, J. V.: A Study of Adenocarcinoma of the Fundus of the Uterus. *Am. J. Obst. & Gynec.*, 1922, iv, 241.

This article is based upon a study of forty-four cases of adenocarcinoma of the fundus of the uterus operated upon at the Free Hospital for Women in Brookline, Massachusetts, since 1903.

The uterus was enlarged in many cases but this was not a constant finding. The average age of the patients was 50 years. Seventy-five per cent had had children, the average number being three. The average duration of symptoms was one year and eight months; therefore if more emphasis were laid upon the significance of irregular bleeding the number of cases in which treatment is successful would be greater.

Judging from the statistics, the diagnosis of adenocarcinoma of the fundus is difficult without microscopic study. Atresia of the cervix may be easily confused with it.

Sixty-two and five-tenths per cent of the cases studied are without recurrence to date, five years or more after the operation. Fourteen of the cases were treated between 1903 and 1913, and thirty between 1914 and 1921, an increase of two cases a year.

Adenocarcinoma of the fundus is not a common tumor in hospital practice, there having been but forty-four cases in 9,566 operated upon since 1903, but in private practice it is undoubtedly seen more frequently than carcinoma of the cervix.

Complete hysterectomy (not Wertheim's method) is the most successful treatment. Operation is to be preferred to radium therapy.

Five of the forty-four patients studied had metastatic growths in the adnexa. Therefore bilateral salpingo-oophorectomy should always be performed with the removal of the uterus.

The differential diagnosis from gland hypertrophy is sometimes difficult even with the microscope.

E. L. CORNELL, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Dorland, W. A. N.: A Clinical and Embryological Report of an Extremely Early Tubal Pregnancy; Together with a Study of Decidual Reaction, Intra-Uterine and Ectopic. *Am. J. Obst. & Gynec.*, 1922, iv, 215.

The case reported is of interest because:

1. It is the earliest tubal pregnancy recorded, the embryo measuring only 1.55 mm., or, when the dorsal flexure was straightened, 2.8 mm., and showing but 15 somites.

2. The fallopian tube showed no sign of decidual tissue.

3. A sharp dorsal flexure in the outline of the embryo closely corresponded to that noted in Wilson's embryo. This is not a natural condition, and was produced probably by the contracted position of the ovum in the tube.

4. The optic vesicles were in contact with the overlying ectoderm.

5. The optic vesicle was shown in a very early stage of development. E. L. Cornell, M.D.

Donald, A.: Adenomyoma of the Rectovaginal Space and Its Association with Ovarian Tumors Containing Tarry Material. *J. Obst. & Gynec. Brit. Emp.*, 1922, xxix, 447.

The author has had a series of seven cases of adenomyoma associated with cystic ovarian tumors containing tarry or chocolate material. The tumors were not ordinary ovarian tumors with accidental hæmorrhage but distinct entities. Such growths are nearly always bilateral and very adherent. Frequently they must be dug out of the broad ligament or the side and back of the pelvic cavity. They burrow into the tissues. The lining wall is often quite thick and rather leathery. The author regards these tumors as adenomyomata but states that their exact origin is still unknown.

Seven of Donald's patients were between 41 and 47 years of age. Nine were married and one was single. The one symptom which was present in every case was dysmenorrhœa. In three cases complaint was made of dyspareunia. In six cases a definite, hard, tender mass was felt through the posterior fornix. In a majority of the cases panhysterectomy was done. H. W. Fink, M.D.

Sampson, J. A.: Intestinal Adenomata of the Endometrial Type: Their Importance and Their Relation to Ovarian Hæmatomata of the Endometrial Type (Perforating Hæmorrhagic Cysts of the Ovary). *Arch. Surg.*, 1922, v, 217.

The adenomata of endothelial type occurring in the intestines are similar to those found in the ovary, tube, or uterus. The parts of the intestines usually involved are the sigmoid, rectum, appendix, and terminal loop of the ileum.

The lesions are: (1) surface and superficial implantations; (2) implantations developing between adherent folds of the peritoneum; and (3) deep invasions of the underlying structures.

Often they do not produce any symptoms. In other cases they cause obstruction.

The treatment is removal of the ovaries. The intestinal lesions should be removed only when they cause obstruction.

The condition is usually found during the latter half of the menstrual life of women, usually after the thirtieth year of age, and occurs in more than half the cases of ovarian adenoma of the endometrial type. The author gives the histories of twelve cases. R. E. Christie, M.D.

Shaw, W. F., and Addis, W. R.: Adenomyoma of the Rectogenital Space Associated with Tarry Cysts Arising in Islands of Adenomyomatous Tissue in the Ovary. *J. Obst. & Gynec. Brit. Emp.*, 1922, xxix, 452.

The authors report the sixth of a series of cases of adenomyoma of the rectogenital space associated with tarry cysts of the ovary. That these cysts originate in adenomyomatous tissue in the ovary had been contended for a long time on clinical grounds, but it remained for Cullen and Sampson to show microscopically that they contain in their walls islands of endometrial tissue.

The case reported was that of a married woman 38 years of age who had had no children. The chief complaint was dysmenorrhœa of one year's duration. Examination revealed a firmly fixed irregular tumor, apparently arising from the uterus, which filled the pelvis and extended up into the abdominal cavity to a point four fingerbreadths above the pubes. At operation the growth was found to consist of a mass of fibroids in the uterine wall. The right ovary was above the pelvic brim and adherent to the bowel. The left ovary was buried in adhesions obliterating the pouch of Douglas.

Removal of the appendages and uterus was extremely difficult. The fibroids formed an irregular globular mass the size of a turnip. The left ovary was the size of a tangerine orange.

On section, the ovarian substance was found to be replaced almost entirely by a series of thick-walled cysts containing dark chocolate-colored fluid of a tarry consistency. The left tube was normal. The right ovary, which was smaller, consisted of two main cysts with contents similar to the material in the left ovary. The right tube was normal. Microscopic examination of tissue taken from the cyst walls showed distinctly structures comparable in all respects to adenomyomatous tissue, including smooth muscle and gland spaces lined with cubical endothelium indistinguishable from endometrium.

H. W. Fink, M.D.

Probstner, A.: Results of the Surgical Treatment of Long-Standing Tumors of the Adnexa (Heilresulte der chirurgisch behandelten chronischen Adnextumoren). *Orvosi hetil.*, 1922, lxvi, 151.

Operative treatment is justified only in cases in which the tumor has been present for years, has resisted all conservative treatment, and causes

severe symptoms or incapacity for work. In any case operation should not be performed until several months after the disappearance of inflammation.

The operation is usually radical, with total removal of the uterus. A conservative operation is performed only in unilateral (puerperal) cases. In 101 cases operated on radically during the past five years, there were five deaths, two from peritonitis, two from sepsis, and one from embolism. Of the patients who survived, 95.5 per cent were able to work and 81 per cent were entirely free from symptoms (fifty-nine of sixty-seven examined subsequently). In twenty-eight cases operated on conservatively there were no deaths, and of the seventeen women subsequently examined, twelve (70 per cent) were cured, three (17.6 per cent) were better but not entirely well, and two were no better.

The results of the conservative procedure are thus seen to be less favorable than those of the radical operation, even when the cases are carefully selected. The only disadvantage of the radical treatment is that it produces an artificial menopause, but the symptoms of this condition are noted chiefly in nervous women and are never so severe as seriously to diminish the good results of the operation.

POLYA (Z).

EXTERNAL GENITALIA

Lagoutte: The Formation of an Artificial Vagina by the Transplantation of a Loop of Intestine. (Création d'un vagin artificiel par transplantation d'une anse intestinale). *Lyon chirurg.*, 1922, xix, 445.

In two cases of absence of the vagina Lagoutte operated successfully by Baldwin's method, viz., the transplantation of a loop of the small intestine. A transverse incision was made in the depression corresponding to the vagina, a median laparotomy then done, and a loop of the small intestine exteriorized at a distance of about 20 cm. from the ileocæcal valve. About 15 cm. of this loop was then resected and the ends of the gut were anastomosed. The mesentery was included in the resection. The rudimentary uterus and ovaries were removed and the two broad ligaments united and brought down to the perineum. A canal was then hollowed out for the new vagina, and the intestinal loop brought down to the perineum and fixed in place by suturing the mesentery. This having been done, the loop was opened and sutured to the remains of the vaginal mucosa.

A satisfactory result was obtained. In neither case was there excessive secretion of mucus from the transplanted loop.

W. A. BRENNAN.

Camera, U.: A New Method for the Surgical Treatment of Congenital Vaginal Anus (Sopra un nuovo metodo di trattamento chirurgico dell'ano vaginale congenito). *Ann. ital. di chir.*, 1922, i, 473.

A rectal outlet in the female genital tract is a rather rare congenital deformity, and the occurrence of the outlet in the vagina is particularly rare.

The usual method of treating both vulvovestibular and vaginorectal fistulæ consists in dissecting the rectum and fixing it at a new anus. When the rectal outlet is situated deep in the vagina, however, this operation is extremely difficult.

In a case operated upon by the author, that of a child 3 years old, the rectal aperture in the vagina had destroyed a part of the posterior vaginal wall and caused marked vaginal atresia. As the ordinary operative methods were not applicable, Camera decided to perform a plastic operation on the posterior wall. An iliac anus was first formed. When this was functioning well, a posterior median incision was made, extending from the middle part of the sacrum to the bi-ischiatic line, and the coccyx was isolated and resected. The lower extremity of the rectum was then easily found in the posterior vagina. There was no muscle structure corresponding to an external sphincter but the levator ani was inserted at the head of the rectal cul-de-sac. The rectal communication with the vagina was explored through a longitudinal cut in the intestine and the rectum then cut away, passed through the fascia of the levator ani to the sacroperineal incision, and sutured to the skin.

There was some postoperative perirectal suppuration but the new anus was definitely formed by the fortieth day and evacuations occurred daily.

W. A. BRENNAN.

MISCELLANEOUS

Bird, F. D.: Note on a Form of Pelvic Hydatid Cyst and Its Treatment. *Med. J. Australia*, 1922, ii, 289.

The author reports his treatment of three cases of pelvic echinococcus cyst involving the prostate. Through a suprapubic incision the cyst cavity was emptied by means of an ovum forceps, gently irrigated, and drained. The after-treatment consisted of relieving the pain and keeping the drain tube open until its removal.

C. H. DAVIS, M.D.

Young, J. V.: Intermittent Aspiratory Hyperæmia in Gynecology. *Am. J. Obst. & Gynec.*, 1922, iv, 280.

When the lesion to be treated is an infection of the cervical glands alone the instrument described by the author may be used as a suction pump only, but as in most cases there is an ascending lymphangitis with a peri-adnexitis, aspiratory stimulation is also of great importance.

In circulatory stasis due to subinvolution or malposition, or both, aspiratory stimulation is of the greatest value. As a method of cleansing the cervix and preparing it for topical applications it is most serviceable. When the infected glands have become cysts, they may be punctured and pumped empty and the cavity filled with a blood clot.

Of 178 cases (76 those of nulliparæ and 102 those of multiparæ) 107 were cured, forty-seven were benefited, and twenty-four not benefited.

There can be no doubt that cervical infection is much more frequent and much more important as a focal infection and a point of entry that is generally believed.

Intermittent aspiratory hyperæmia is a method by which infected cervical glands may be drained and a temporary hyperæmia induced to eliminate the infection. Hyperæmia will also stimulate the uterine muscle to rhythmical contraction, thereby improving the uterine tone and relieving circulatory stasis and inflammatory conditions.

E. L. Cornell, M.D.

Albertin: The "Douglas Cry" in Women (Le "cri du Douglas" chez la femme). *Lyon chirurg.*, 1922, xix, 479.

Nearly twenty years, when carrying out a laparotomy on a woman, Albertin observed that when the fundus of the Douglas cul-de-sac was wiped a pharyngolaryngeal reflex caused the patient to utter a sharp and prolonged cry. On repetition, the manœuvre always gave the same result. Albertin calls the sound the "Douglas cry." He has found that a great many other surgeons have observed the same phenomenon. Albertin now reports it as recently he has studied the work of Latarjet on the innervation of the uterus which shows that the Douglas sac has a rich supply of sympathetic nerve filaments. He states that many of the acute vaginal pains of which women complain after a colpotomy or hysterectomy and the pressure pain in the Douglas region are explained by very great sensitiveness of the Douglas sac. The presence of such sensitiveness is very suggestive of ovarian degeneracy.

In discussing Albertin's paper Tixier said that the Douglas cry can be produced also in men. He has caused it by prostatorectal dilatation even under deep anæsthesia. The cry is a danger signal. Cases are known of severe and even fatal anæsthetic syncope in rectal dilatation, and it is possible that there is some relationship between the Douglas sac reflex and this serious complication.

W. A. Brennan.

Naegelsbach: Malignant Chorionic Epithelioma with Hæmorrhage into the Abdominal Cavity (Malignes Chorionepitheliom mit Verblutung in die Bauchhöhle). *Muenchen. med. Wchnschr.*, 1922, lxix, 510.

The author reports the case of a woman who suddenly collapsed with symptoms pointing to tubal rupture. A year previously she had been curetted on account of a miscarriage.

Immediate laparotomy revealed, in addition to a large quantity of free blood in the abdominal cavity, a somewhat enlarged uterus with a small area of bloody tissue without serous covering on its anterior wall. Supravaginal amputation of the uterus was done. Death occurred a few hours later in spite of the reinfusion of blood and the usual restorative methods.

This was a case of intramural chorionic epithelioma which originated in the pregnancy of the previous year and caused perforation. Deucas (Z).

Macomber, D.: The Etiology of Sterility in the Female, from an Analysis of 500 Case Records. *Boston M. & S. J.*, 1922, clxxxvii, 917.

As many of the 500 records were incomplete and in many of the cases the sterility was due to the male, this article is based on the findings in 337 cases. The conditions responsible are given as follows:

PATHOLOGIC CLASSIFICATION OF FEMALE STERILITY

	Per cent
Closed tubes	19
Tuberculous tubes	4
Endocervicitis	5
Endometritis	2
Total cases due to inflammation	30
Retroversion	11
Fibroids and miscellaneous	8
Simple congestion	4
Total cases due to congestion	23
Anteflexion	19
Double uterus, etc	1
Infantile uterus	4
Total cases due to developmental errors	24
Anteflexion and ovaries	8
Retroversion and ovaries	3
Ovaries alone	8
Age, diet, menopause	4
Total cases due to ovarian conditions	23

Sterility may be due to either the male or the female, the incidence of the condition being the same in both sexes. When the female is reponsible the chances are about even that the cause is pathologic on the one hand or developmental or functional on the other. About one-fourth of the women studied had closed tubes or some other inflammatory condition. In one-fourth the sterility was due to congestion. In another fourth the cause was essentially developmental, and in another, failure of ovulation. In sterility due primarily to disturbances of function the treatment of pathologic lesions alone will seldom be successful.

E. L. Cornell, M.D.

Pomeroy, L. A., and Milward, F. W.: A Case of Primary Carcinoma of the Female Urethra Treated with Radium. *Surg., Gynec. & Obst.*, 1922, xxxv, 355.

The authors report this case because of the great rarity of the condition. The fact is emphasized that a caruncle had been present for several years before the development of the malignancy. At the time of examination a large, foul ulcerating mass was found filling the entire introitus and extending about 3 cm. upward along the posterior wall of the urethra. The patient still retained urethral control. A tentative clinical diagnosis of primary carcinoma of the urethra was made and a small section of tissue removed for pathologic examination. The pathol-

ogist's diagnosis was probable caruncle which had undergone carcinomatous proliferation.

Although no definite evidence of lymphatic involvement could be made out, it was thought best, because of the patient's advanced age and the extent of the lesion, to apply radium rather than to risk the shock of a more or less extensive operation. Five steel needles each containing 10 mgm. of radium element were inserted directly into the tumor at about equal distances from each other and allowed to remain in position for twelve hours. In addition, one tube containing 50 mgm. of radium element screened with 0.5 mm. of silver, 1 mm. of brass, and 1 mm. of hard rubber was inserted into the urethral canal and allowed to remain for four hours. The total radium treatment therefore equaled 800 mgm.-hrs.

The patient had only the usual postoperative and radium nausea, and two days after the treatment was up and about without any unusual symptoms. Twelve days after the treatment she had suffered no tenesmus or other symptoms, and examination showed that the mass was one third less in size and much cleaner, and that the discharge was considerably reduced.

The authors' conclusions are summarized as follows:

1. Primary carcinoma of the female urethra is a rare disease, only sixty-eight cases having been reported in the literature.

2. Urethral caruncle, a relatively common affection in women, may be followed by malignant degeneration; hence the importance of its early recognition and treatment.

3. Urethral cancer should be recognized early and given rigorous treatment.

4. In the early cases the treatment should consist of radical extirpation. Even resection of the bladder may be indicated, but this is rarely necessary. In most cases the vesical sphincter can be saved in the operative procedure.

5. Radium should be used after all operations, and in well-advanced cases may be employed alone.

ADOLPH HARTUNG, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Braasch, W. F., and Scholl, A. J., Jr.: Pathological Complications with Duplication of the Renal Pelvis and Ureter (Double Kidney). *Surg., Gynec. & Obst.*, 1922, xxxv, 401.

A review of the records of 144 patients observed at the Mayo Clinic since 1907, in whom duplication of the pelvis and ureter was found, revealed that 135 (94 percent) had unilateral duplication and nine (6 per cent) had bilateral duplication. In forty-four cases the duplication was complete; in 100 cases, incomplete.

There is usually a difference in the size of the pelves of a double kidney, the upper pelvis being the smaller. In spite of this, the function of the two segments is usually equal. Microscopically the tissue between the two segments is demonstrated to be a complete histologic unity. In some cases the capsule dips into the renal mass, making a definite partial division. In the specimens examined, glomeruli and renal tubules were almost always found in the parenchyma between the two pelves.

The diagnosis of complete duplication is comparatively easy by cystoscopic examination. In incomplete duplication, however, the condition is discovered only by means of a routine pyeloureterogram. The cystoscopist should always be on the look-out for the third opening. When three ureters are present the usual method of catheterization by removing the cystoscope and re-introducing it is awkward and painful. The authors have devised a three-way catheterizing guide which overcomes this. It is difficult to estimate the definite function of each of the two segments, particularly if one is diseased. Unless good function can be demonstrated in one segment, a heminephrectomy is out of the question. Pyelography is of value in determining the distance separating the two pelves, as well as the pathologic condition present. The distinction between the small pelvis of atrophic pyelonephritis and the upper pelvis seen in duplication may be difficult because of pathologic complications.

The series of 144 patients were divided into four groups: (1) thirty patients with pathologic complications who were operated on; (2) twenty-four patients in whom definite pathologic complications were found but on whom operation was not performed; (3) twenty-nine patients in whom there was doubtful evidence of a pathologic lesion; and (4) sixty-one (42 per cent) patients in whom the discovery was purely accidental and no complications were noted.

The most common lesion calling for surgical treatment is hydronephrosis caused by stricture of the ureter. Of the six double kidneys removed for tuberculosis the disease primarily involved and was largely confined to the lower segment in five. Stone in the ureter in these cases is often situated at the point of ureteral division.

Surgical treatment was carried out in thirty cases: nephrectomy in fifteen, heminephrectomy (two patients required complete nephrectomy later) in four, pelviolithotomy in six; ureterolithotomy in three, cutting of anomalous blood vessels to relieve hydronephrosis in one; and ligation of an aberrant (upper) ureter which opened in the vagina in one.

In most instances the pathologic complications other than lithiasis with double kidney require nephrectomy. Complete nephrectomy was subsequently performed in two of four cases of heminephrectomy because of infection in the remaining portion of the kidney. Unless the lesion is confined entirely to one segment and the clinical evidence shows definitely that the remaining segment is normal with sufficient function to warrant the procedure, heminephrectomy should not be attempted. Even under such favorable circumstances the infection may invade the remaining segment, necessitating secondary nephrectomy.

Runeberg, B.: Hæmatogenous Acute Infectious Nephritis and Pyelonephritis (Nephrites hématogènes, aiguës infectieuses et pyélonéphrites). *Acta chirurg. Scand.*, 1922, lv, 158.

Runeberg reports 250 cases of infection in the urinary tract. At least 50 per cent of the acute cases observed in his clinic are cases of nephritis or pyelonephritis. The infection occurs through the blood and is often wrongly diagnosed as appendicitis or cholecystitis. In order to determine the pathogenesis of these conditions Runeberg made a histologic examination of a large number of kidneys obtained at nephrectomy or autopsy. He distinguishes two essentially different types of cases:

Group 1. Focal glomerulitis. In this condition there is a slight epithelial degeneration especially in the convoluted tubules, multiple foci in the papillary zones, and inflammatory areas in the wall of the pelvis and along the renal vessels. The bacteria reach the kidney by way of the blood stream and when eliminated through the glomeruli produce inflammation. When retained in the canals they form foci from which they spread to the pelvis and cause pyelitis. The pyelitis produces by the lymphatic route a disseminated nephritis characterized by infarcts with miliary abscesses. Runeberg calls these conditions "elimination nephritis with pyelitis" and "secondary pyelonephritis."

Group 2. Purulent foci irregularly disseminated in the cortical and medullary substance. Important alterations in the kidney or pelvis are rare. The

bacterial emboli becomes fixed in the ramifications of the renal vessels, giving rise to abscesses outside the canalicular system of the kidney which, by continuation, may cause intra- or extra-renal purulent processes. Runeberg calls this condition "aposthematous nephritis metastizing by the formation of emboli."

In the majority of the cases the infection is due to the bacillus coli or a staphylococcus. A hæmatogenous colon-bacillus infection is always an elimination nephritis. Nephritis, pyelitis, and pyelonephritis due to the colon bacillus are only more or less accentuated phases of the same process. The early stage is characterized by fever, slight urinary symptoms, and vague lumbar pain. The urine contains a large quantity of albumin, and blood is often detected with bacteria in the sediment. When the stage of pyelitis is reached the principal symptom is sharp renal pain and tenesmus.

Staphylococcic infections frequently cause focal metastatic purulent nephritis by the formation of emboli. The foci are often outside the secretory parts of the kidney. The urine contains white and red cells and bacteria, but no trace of albumin.

Elimination nephritis due to staphylococcic infection resembles colon bacillus nephritis but also differs from it in several points. It occurs more frequently in men than in women. The nephritis period is often short, the condition then simulating cystitis and pyelitis. In nephritis due to the colon bacillus the primary pyelonephritis is often longer than in the staphylococcus infections and the pyelonephritis crises are not so frequent.

The majority of cases of acute infectious hæmatogenous nephritis and pyelonephritis can be quickly cured by conservative treatment. Operative intervention is not necessary during the acute period unless there is danger of anuria or septicæmia. Runeberg strongly advocates the use of a urethral retention sound, especially in superacute pyelonephritis with symptoms of retention. In chronic unilateral pyelonephritis and pyelonephrosis nephrectomy is indicated.

W. A. Brennan.

Mayhew, J. M., and Smith, A. L.: The Diagnosis and Treatment of Pyelitis. *Nebraska State M. J.*, 1922, vii, 319.

The symptoms and signs of pyelitis and its causative factors are protean and may simulate those of practically any organ in the abdomen. The principal erroneous diagnoses are appendicitis, abnormal conditions of the female organs, the biliary apparatus, or the duodenum and stomach, and postoperative adhesions.

The common causes of pyelitis are: (1) remote infections, (2) constipation, (3) ureteral calculus, (4) pelvic calculus, (5) infection and associated abnormalities lower in the genito-urinary tract, (6) ureteral angulations, (7) ureteral strictures, (8) nephroptosis, and (9) neoplasms of the kidney.

The common complications are: (1) hydronephrosis, (2) pyonephrosis, (3) pyelonephritis, (4) perinephritic abscess, (5) destruction of kidney tissue, (6) hydro-ureter, and (7) cystitis.

Any bacterium may be the active cause of the infection. The bacillus coli communis is the invading organism in a large percentage of cases.

The diagnosis of pyelitis rests upon the physical, X-ray, and cystoscopic findings. The examination should consist of: (1) the history and a complete physical examination; (2) an X-ray examination of the abdomen; and (3) cystoscopic examination and ureteral catheterization.

The treatment giving the best results consists of:

1. Eradication of all infections, however remote.
2. Regulation of the bowels.
3. Treatment of local associated pathologic conditions.
4. The administration by mouth of large amounts of water and the changing of the reaction of the urine every ten days.
5. Catheterization and drainage of the pelvis of the kidney followed by lavage with boric acid solution and the injection of 1 per cent silver nitrate solution one to three times a week.

The authors report three cases to illustrate the value of the methods mentioned:

Case 1 was that of a woman 25 years of age who had an appendectomy four years ago for pain and rigidity in the right lower abdomen. The pain had continued intermittently, and the patient had been advised that an operation to free adhesions was necessary.

Examination of the right kidney revealed pyelitis, a calculus in the pelvis, and lowered function.

The true cause of the abdominal pain was a stone in the pelvis and later another in the ureter. Following the correction of these abnormalities the pain ceased.

Case 2 was that of a woman 34 years of age. Pain had been present in the left side of the abdomen for the past five years in spite of five abdominal operations during this period. A surgeon finally decided to remove the left kidney because a roentgenologist reported it much enlarged.

The examination made by the authors revealed a perfectly normal left kidney but a pyonephrotic right kidney. The right ureter showed a stricture and an angulation. The function of the right kidney was practically nil. This case shows that pain, tenderness, and enlargement are not unusual in a normal kidney which must double its excretory function.

Case 3 was that of a woman 38 years of age who complained of pain in upper part of the abdomen on the right side, shortness of breath, and sharp pain in the heart region. A diagnosis of gall-stones had been made by a surgeon and operation advised.

A general examination revealed a peridental infection and myocarditis. The urine from the right kidney contained a large number of pus cells, a trace of albumin, and colon bacilli. The capacity of the pelvis was increased to 35 c.cm. The normal rhythm of the ureteral flow was absent and function reduced to one-third normal. Pyelography showed a greatly

dilated pelvis with partial destruction of the secondary calices. A diagnosis of first-degree pyonephrosis was made. The offending tooth was extracted, the patient kept in bed until the heart function was normal, and the kidney condition treated as outlined.

THEODORE DROZDOWITZ, M.D.

Kreutzmann, H. A. R.: Studies in Ureteral Catheterization: Preliminary Report. *California State J. M.*, 1922, xx, 310.

This study was undertaken by the author in an attempt to determine whether or not the present disadvantages of ureteral catheterization could be overcome by inserting the catheters only part way into the ureters.

The patient was subjected to catheterization three times at intervals of one week. No. 6 ureteral catheters were used throughout. At the first sitting they were inserted 5 cm. into the ureters, the second time 14 cm., and the third time the full distance into the kidney pelvis. After the insertion of the catheters 1 c.cm. of phenolsulphonephthalein solution was injected intravenously with a Record syringe.

The conclusions drawn are as follows:

In ureteral catheterization the occurrence of pain, hæmaturia, and anuria increases in direct ratio to the distance the catheters are inserted.

Catheterization as at present performed has frequently a depressing action on the kidney function.

Accurate information as to relative kidney function cannot be obtained if the catheters are inserted only a few centimeters into the ureters.

The only constriction of importance in ureteral catheterization is at the junction of the ureter and the bladder.

The passage of a medium-sized catheter causes passive dilatation of the ureterovesical sphincter which lasts at least one week.

Repeated catheterization causes still greater dilatation of the sphincter with a further increase in the amount of leakage. LOUIS GROSS M.D.

BLADDER, URETHRA, AND PENIS

Goljanitzki, J.: A New Procedure for the Formation of a Sphincter for the Bladder [Ein neues Verfahren zur Sphinkterbildung an der Harnblase]. *Neuy Chir. Arch.*, 1922, ii, 153.

A man 23 years of age with total paraplegia due to a gunshot injury recovered his ability to walk after six months, but the incontinence of fæces and urine persisted. Two years after the injury he was admitted to the hospital with deep decubital ulcers caused by the urinal. The bullet, which the roentgenogram showed at the left side of the fourth lumbar vertebra, was not found at laminectomy, whereupon the following operation was performed:

In the lithotomy position a median incision 12 cm. long was made from the scrotal insertion to the anus through skin and aponeurosis, and the musculature of the pelvic floor was split transversely and bluntly dissected further. The bulb was displaced upward, the anus downward, and the membranous part of the urethra was isolated and a ligature was carried around it. By means of this suture, a strip 12 cm. long was taken from the fascia lata and shoved under the urethra, over which the ends were crossed and fastened with interrupted sutures to two strands of muscle obtained from muscles inserted at the tuber ischii (adductor muscle and biceps). Figure-of-eight sutures and a retention catheter were then inserted.

Galvano-faradization was applied daily at the end of three weeks. Two weeks later the patient reported that by putting his thigh muscles under tension in the standing position he could retain his urine for one hour or longer. After two and one-half months the function became better and the patient desired a similar operation on the rectum.

The author has devised a suitable plan of operation based on the belief that a muscle plastic on the gluteus maximus muscle will act mechanically and also innervate the external sphincter.

VON DER OSTEN-SACKEN (Z).

Scholl, A. J., and Braasch, W. F.: Pre-Operative Treatment of Malignant Tumors of the Bladder by Radium. *Arch. Surg.*, 1922, v, 334.

Certain types of tumors of the bladder respond readily to excision, while others offer an extremely poor prognosis. Because of the difficulty of completely eradicating the tumor and its frequent cellular transplants, recurrence is early and extensive. This is particularly true of the solid, meaty epitheliomata which commonly occur in the base of the bladder. Small infiltrating wedges of actively malignant cells which project down through the muscle bundles are often cut across when a portion of the bladder is excised. The undisturbed clumps of cells which remain in the normal tissue act as foci, spread rapidly and extensively, and often soon attain an inoperable size.

Epithelial tumors of the bladder rarely metastasize; persons who die from malignancy of the bladder usually succumb because of the local condition. Any procedure which would aid in effectually eliminating the local condition would in many cases effect a cure.

Recently the flat infiltrating tumors have been treated with radium emanations prior to operation. Small amounts of radium are used with the idea, not of completely destroying the growth, but of diminishing the capacity of the cell to proliferate. This is done to inhibit early recurrences from segments not removed and to prevent re-implantation of cells freed during the excision of the tumor.

Under sacral anæsthesia the direct cystoscope is passed, the distal opening of the instrument placed on the tumor, and the eye piece detached. This allows the water a free exit, and the contraction of the bladder firmly implants the tumor against the open end of the instrument and holds it in place until the point of the radium needle can be inserted and the tube driven into the growth. The bladder is then filled with water and a second area of the tumor

located. This procedure is repeated until the tubes of radium emanation have been studded throughout the growth, about one to every square centimeter of tumor tissue.

Specimens removed from the tumor before radiation are later compared with the tumor removed at operation.

The most striking feature of radiated tumors is an extreme fibrosis which produces an extensive walling off, replacement, and destruction of the tumor cell.

In some cases the radium rays undoubtedly destroyed the proliferating powers of the cells completely, but in a number of tumors nests of apparently intact malignant cells were found. These cells generally walled off by extreme fibrosis, were apparently quiescent at the time of operation as a result of the exposure to the radium rays.

The insertion of tubes of radium emanation is a very simple procedure which may be done at the time of the first examination. The small amount of radium rays is slowly discharged and very little reaction is produced. Most tumors of the bladder are superficially placed, thrombosis of the blood vessels develops early, and consequently the absorption of necrotic or toxic substances is slight.

During the period between the insertion of the radium emanations and the operation a daily bladder lavage is given which not only removes any necrotic slough but also reduces infection of the bladder which is often present.

Emanation tubes are not satisfactory in malignant papillomata as the loose structure of these tumors does not hold the tubes in place long enough for them to be effective. In the majority of cases in which the emanation tubes have been used the patients have been of advanced age and have had wide-spread, highly malignant growths requiring extensive operation.

Lower, W. E.: The End-Results of Operations for Cancer of the Bladder. *Ann. Surg.*, 1922, lxxvi, 352.

Some surgeons believe that all bladder tumors are potentially malignant while others base the diagnosis entirely upon the histologic findings. The methods of classification also vary. Burger's classification has been widely accepted.

Geraghty in 1916 classified bladder tumors from the therapeutic standpoint. Judd and Harrington divide them into two classes, one consisting of those which can be treated satisfactorily by endovesical methods, and the other, those requiring operation. According to Uhle and MacKinney, there are two types of tumor, those amenable to destruction by the high-frequency current and those which must be dealt with by radical operation.

As it is often impossible to determine the type of the growth from the frozen section at the time of operation, the author believes that the cystoscopic examination which shows the tumor to be pedunculated or sessile, encrusted or sloughing, single or multiple, is about as dependable as any method of diagnosis.

Three cardinal symptoms of bladder tumor are hæmaturia, pain, and frequency of urination. Burger stated that malignancy is indicated by: (1) induration noted on rectal, vaginal, or cystoscopic examination; (2) sloughing; (3) lack of reaction to fulguration (Braasch states that if a tumor does not respond to three or four treatments with the high-frequency current it may be considered malignant; (4) the age of the patient; and (5) the number and size of the tumors (so-called benign tumors are apt to be multiple).

The operability of a tumor depends on the length of time that has elapsed between the first symptoms and the operation. In 115 cases cited by Lynch the symptoms had been present for from one to four years in 70 per cent and from three to four years in 40 per cent. In 75 cases reported by Caulk the average duration of symptoms was ten years, while in 181 cases reviewed by Judd it was twenty-six months, and in sixty-two cases cited by Thomas it varied from two weeks to twenty-five years. Tardy recognition is not due to absence of symptoms but to lack of appreciation of their significance. Blood in the urine is always pathologic.

Lower's report deals only with the surgical treatment, that is, excision or removal with the actual cautery. Lower still believes that carcinoma is a local disease, that rational treatment consists in complete and radical excision of the involved area, and that the condition remains local for a long period and does not metastasize readily. In 1915 Gardner stated that the transperitoneal method or subtotal cystectomy gave the best results. Lower feels that a freer dissection of the bladder from the peritoneum, walling off of the surrounding areas, better protection of the tissues, and when possible, clamping around the tumor before the bladder is opened, and cutting on the bladder side of the clamp is an efficient method of preventing contamination and the transplantation of cancer cells.

The tendency of all malignant bladder tumors to recur, whatever method of removal is used, has long been recognized. Constant vigilance is therefore necessary. The patient should be told to return for cystoscopic examination twice at intervals of three months, three times at intervals of six months, and three times at intervals of one year, thus covering a period of five years. The absence of recurrence after five years seems to indicate a cure.

With regard to end results, the author quotes Gardner, Thomas, Geraghty, and Scholl whose reports are based on a total of 2,242 cases. He then gives the results in 108 cases of his own, bringing the total number to 2,350. The study of these reports leads to the following conclusions.

1. A large percentage of malignant tumors are of papillary origin and therefore not referred to the surgeon until late.

2. The percentage of recurrence is high whether excision or cauterization is done.

3. Recurrence is not a contra-indication to treatment as some of the best results have come from operation for recurrences.

4. Continued observation after operation is essential if the mortality of carcinoma of the bladder is to be reduced.

5. The good results of the treatment of recurrences are due to the fact that recurrences are nearly always local and very seldom metastasize.

JOHN P. O'NEIL, M.D

Fronstein, R.: Gunshot Injuries of the Urethra and Their Treatment (Schussverletzungen der Harnröhre und ihre Behandlung). *Newy Chir. Arch.*, 1922, ii, 119.

At the beginning of the war adequate guiding principles for the treatment of injuries of the urethra were lacking because in civil practice injuries of the pendulous portion are very rare and injuries of the perineal portion are seen rather as complications of extensive wounds of the soft parts, rectal lesions, etc. In war, the reverse is true, isolated injuries of the penis being common and the break in the continuity of the urethra more important than the perforation of the surrounding tissues.

Fronstein reports 152 cases. The pendulous portion of the urethra was affected in forty-five, and the scrotal or perineal portion in 107. Among the latter there were fourteen cases of isolated injury of the urethra.

Strangury is characteristic of an injury of the urethra: this either cannot be relieved at all or is relieved immediately. The prognosis depends upon its presence or absence and the condition of the para-urethral tissues. When sufficient time elapses between the injury and the first micturition (five to seven hours), a fistulous canal forms without urinary infiltration and the subsequent constriction is correspondingly slight.

Patients admitted to the hospital before the first emptying of urine should not be tested functionally even when injury of the urethra is suspected, but should be taken under treatment directly with periodic catheterization, preferably with a silk catheter having a Mercier bend. If a rupture of the urethra is demonstrated and the patient has not yet urinated, treatment must be directed to securing regular emptying of the bladder, the prevention of urinary infiltration and stricture, and the hastening of the healing of the wound. The first two objects are accomplished most easily with a retention catheter. This should be changed as seldom as possible because if its re-introduction meets with an obstruction the formation of a proximal fistula, retrograde catheterization, and urethrotomy will be necessary. The author denies that the retention catheter favors the formation of strictures.

If a ragged urethral wound is not primarily resected or the sutured wound does not heal by primary intention, stenoses are unavoidable. On the other hand, the retention catheter hinders spontaneous closure of the fistulous tracts and should therefore be removed as soon as possible, that is, as soon as the wound of the soft parts begins to cicatrize and the danger of urinary infiltration appears to be passed. If then the fistula does not heal spontaneously, it must be excised. As failure to heal is usually due to the presence of a foreign body such as a silk ligature, the author uses catgut even in plastic operations, employing silk only for skin sutures. To cover defects he uses non-pedicled flaps of fascia lata and the inner fold of the prepuce. Even with very large flaps, however, he was unable to prevent stricture formation. He considers the mobilization of the urethral tube more important, and when the defect was not too large got along without transplantation. After completion of the row of sutures the catheter should be removed. When the mucosa was not included in the suture and erections were prevented, healing resulted even without central diversion of the urine.

In the treatment of strictures the author met with several unfavorable conditions. Whereas traumatic fistula could be prevented in one way or another or cured, this was not true of strictures. Preventive operations, consisting of excision of the crushed edges and primary suture, are justifiable, but in practice conditions are such that a certain amount of stenosis is unavoidable. Therefore if the cicatricial tissue is slight in amount and soft, and if the use of a bougie has not been necessary for two or three years, the patient may be considered cured. The treatment of stricture should be operative, provided the careful use of a bougie in conjunction with hot baths or sulphur baths has been ineffective. The results depend not so much upon the operative procedure as upon the nature of the injury. The author classifies injuries into five classes with an increasingly poor prognosis: (1) tangential transverse injuries of the urethral wall; (2) ruptures of the urethral wall without special involvement of the para-urethral tissues; (3) longitudinal tears; (4) more extensive dismemberment of the urethra and its surroundings; (5) injuries in the sphincteric portion.

In cases of the first class a sickle-shaped cicatrix forms and can be easily removed by a double internal urethrotomy. In those of the second class there is a ring-shaped or cylindrical rigid stenosis and according to the circumference of the stricture urethrotomy or resection is indicated. Cases of the third class should be treated with external urethrotomy, excision of the scar, and suture. The author obtained a cure in 60 to 65 per cent of cases without the use of a retention catheter by beginning with the use of bougies ten to eleven days after the operation. For cases of the fourth class he advises radical methods. He has had no failures when, after the resection, the cut edges of the urethra were sutured and the urine diverted. If primary suture was impossible because the diastasis was too great it was nevertheless possible to hold the unavoidable cicatricial recurrences within moderate limits after the resection and to achieve good results by the use of

bougies and urethrotomy. The fifth class of cases are usually complicated by injuries of the rectum and the pelvic bones. Even after the subsidence of the symptoms, extensive cicatricial deformities remain which, in conjunction with the loss of the active dilatability of the prostatic portion, often present insurmountable difficulties. The author was compelled to discharge three patients with suprapubic bladder fistula and believes that in two other cases he will be obliged to implant the ureters into the rectum. von der Ostén-Sacken (Z).

GENITAL ORGANS

Chessin, W.: The Operation of Lowering into the Scrotum the Testicle Retained in the Inguinal Canal (Zur Operation der Herabfuehrung des im Inguinalkanal retenierten Hodens in das Skrotum). *Medic. J.*, 1921, i, 39.

The author establishes the principle that the testis must not be removed for cryptorchidism because, although the spermatogenetic system is usually atrophied, the secondary gland is not.

In regard to the proper age for operation, he states that the testis frequently sinks down into the scrotum spontaneously and therefore the operation should not be done too early. If the testis has been displaced into the upper part of the scrotum, it needs no additional fixation as it usually sinks down spontaneously and normal development is only hindered by fixation.

Chessin has performed the operation twelve times on ten patients. Eight of the cases have been under observation for periods ranging from six months to five years. The result was good in two cases, satisfactory in three, and poor in three. All of the patients were over 18 years of age. In nine cases the spermatic cord was extensively mobilized, and in three complete mobilization was not attempted.

In the author's opinion extensive mobilization of the spermatic cord is the most important part of the operation. Not only should the vas deferens and its blood vessels be mobilized most carefully along the course of the entire inguinal canal, but the portion of the spermatic cord lying in the pelvis should also be freed. The firm connective-tissue bands, which often fix the spermatic cord to the pelvic tissues, should be divided with the scissors. From the peritoneum the canal can be separated more easily. Even though the blood vessels interfere with the lowering of the testis to a greater extent than the vas, they must never be divided. The loosening of the blood vessels in the pelvis is accomplished easily but is less mobilizing than the separation of the canal. Experiments on cadavers show that mobilization of the pelvic parts of the spermatic cord causes an average lengthening of about 1.5 to 2 cm. As there is no reason for fixing the testis in the lower portion of the scrotum, it need be fixed only in the simplest manner, and in children no fixation at all is necessary. In 92 per cent of the cases the indication for operation is usually the presence of a hernia or cyst. The author was unable to determine any enlargement of the atrophic testis after the operation. von Hoser (Z).

Retterer, E., and Voronoff, S.: The Local and General Effects of Resection of the Deferent Canals (Effets locaux et généraux de la résection des canaux déférents). *J. d'urol. méd. et chir.*, 1922, xiv, 81.

Numerous experiments have demonstrated that after ligation or resection of the deferent canals preexisting libido and potentia coeundi persist. The authors' earlier experiments with ligation were not satisfactory as often the continuity of the canals was not interrupted completely. In the experiments reported in this article 6 to 10 cm. of the deferent canals of dogs were resected and the morphological and structural changes caused in the testicular tissues by the resection were compared with the findings of a histological study of the testicles of normal animals whose deferent canals had not been resected.

The authors deal especially with the epithelial lining of the seminiferous tubules. In an adult dog this lining is composed of a common cytoplasm traversed by anastomosed filaments constituting a wide-meshed reticulum. When the deferent canal had been resected for a year the filaments were found to be more abundant and the reticulation closer.

The important fact demonstrated by the investigations is that, contrary to the theory generally accepted since the findings of Ancel and Bouin many years ago, there is no hypertrophy of the interstitial or intertubular connective tissue and the sexual desire and potentia coeundi which persist after resection of the deferent canals are due to the effect upon the organism of the continued secretion of testicular sperm rather than to any action of the so-called puberty gland (interstitial gland).

After resection, those nuclear elements of the testicle which had arrived at their full development at the time of resection show some degeneration, but those which were in the early stages of development continue to develop. Spermatogenic evolution continues in the absence of sperm excretion. The cytoplasm, however, is denser and does not liquefy to form a vehicle by which the spermatozoa can escape. The development is slower and the successive forms of the cellular elements remain where they were produced. Sertoli cells, contrary to accepted notions, are not found in the testicle after resection of the deferent canal.

In the authors' opinion previous observers were too ready to conclude that the seminal layer of cells in the seminiferous tubes degenerated or atrophied. If they had waited and examined the apparently increased Sertoli cells after a period of eight to twelve months they would have found that they had again evolved into a layer of seminal cells.

W. A Brennan

Rankin, F. W., and Judd, E. S.: Emphysema of the Scrotum the Result of Diverticulitis of the Sigmoid with Perforation. *Surg. Gynec. & Obst.*, 1922, xxxv, 310

The patient was a man 46 years of age who registered at the Mayo Clinic November 11, 1921, complaining of pain and soreness in the left lower abdominal quadrant. At first this pain was sharp and shooting and confined to the lower part of the abdomen on the left side but later it radiated into the perineum and across the entire lower part of the abdomen. The patient was nauseated but did not vomit. His temperature was 100 degrees F. There was no blood in the stools and no diarrhœa or constipation. The attacks occurred intermittently for three years, increasing in severity and frequency. Two grains of morphine a day were required for relief. Six weeks before examination marked frequency of urination with burning began although no blood or gravel was found in the urine. On two occasions gas was passed from the urethra.

The physical examination was negative. The urine showed albumin 1, erythrocytes 1, and pus 3. Combined phenolsulphonephthalein test was 50 per cent, and there was ½ oz. of residual urine. The leucocytes numbered 7,800 and the erythrocytes 4,550,000. The hæmoglobin equaled 74 per cent. The roentgenological diagnosis was obstruction in the sigmoid flexure. On digital examination of the rectum an obstruction was met principally on the right side about 9 cm. from the anal orifice. A tentative diagnosis was made of diverticulitis of the sigmoid attached to the bladder causing a secondary cystitis and an intermittent fistula.

Operation November 9, 1921, revealed a mass about 9 cm. in diameter deep in the pelvis and attached to the left wall of the bladder. This was identified as the sigmoid with much inflammatory tissue about it. Multiple diverticula of the sigmoid could be demonstrated above the growth. A loop of ileum adherent in the mass was not removed for fear of perforation. The colon above was greatly distended with gas. Resection of the entire mass seemed too formidable an operation to be performed in one stage; therefore a preliminary colostomy was done.

The immediate convalescence was uneventful. The colostomy had not been opened. On the eighth day the patient complained of quite severe gas pain and suddenly noticed that his scrotum was beginning to swell. This swelling was painless but occurred at a considerable rate. Within two hours the scrotum was about 30 cm. in diameter, and air crackles were heard within it. It seemed certain that the condition was in no way connected with the extravasation of urine as the patient voided with ease and the physical appearance and feel of the tissues were characteristic. The fact that a fistula was known to exist between the bladder and sigmoid did not explain the condition since it offered no anatomical basis for such an emphysema. The abdomen was ballooned up with gas and peristalsis was visible. The colostomy was opened and abdominal distention thereby relieved. The emphysema of the scrotum decreased very gradually; two weeks elapsed before it was complete. The patient was none the worse for this unusual complication.

Because of the peculiar anatomical arrangements it seemed highly improbable that gas made its way into the bladder and thence into the subcutaneous tissues of the scrotum. A more plausible explanation is that leakage from another perforation or the same one burrowed through the peritoneum and under the fascial layers to emerge in front of the triangular ligament and infiltrate the adjacent subcutaneous tissues.

L. H. Fowler, M.D.

SURGERY OF THE EYE AND EAR

EYE

Jameson, P. C.: The Correction of Squint by Muscle Recession with Scleral Suturing. *Arch. Ophth.*, 1922, li, 421.

Muscle recession with scleral suturing primarily attacks the offending muscle where the deformity begins.

It leaves an unmutilated muscle system with a broad, properly placed attachment capable of normal action and vigorous work.

It enlarges the effect of tenotomy by boldly carrying the muscle end back to the equator if necessary. The exposure of the field enables the operator to make valuable observations relative to length, breadth, laxity, tension, and connective-tissue obstructions. It enables him to grade his operation accurately, insures a non-pointed attachment, gives a definite understanding as to where the muscle is fixed, and by reason of scleral fixation renders tenotomy a safe and reliable procedure.

It safeguards convergence to a striking degree. This has been the most gratifying outcome of the operations performed. A powerful muscle properly and broadly attached to the sclera, working from its primary origin at the optic foramen and from its secondary action or origin from the diversion of the check ligament, and supplemented by accessory adductor muscles, is a bulwark for the preservation of convergence.

Its corrective capabilities are extensive and comparatively uniform.

In a high percentage of cases a single recession of 5 mm. with scleral fixation will correct a deviation of 25 degrees.

In many cases a double recession of 4 mm. on both sides with scleral fixation will correct deviation of 35 degrees or more.

The operation of recession with scleral suturing has all the advantages of tenotomy and in addition assures definite scleral fixation, a very important result which is not given by tenotomy.

JAMES P. FITZGERALD, M.D.

Franklin, W. S., and Cordes, F. C.: An Unusual Orbital Tumor. *J. Am. M. Ass.*, 1922, lxxix, 1058.

The case reported was that of a man 30 years of age who had had a tumor removed from his left cheek five years previously. A year before this operation a tumor appeared in the right cheek. At the time of examination by the authors the lids were baggy and full but the eye was not closed. The presence of a subcutaneous tumor not attached to the skin was suggested. Both lachrymal glands, the pre-auricular gland on the left side, and the sublingual glands were palpable. The teeth were in a poor condition and showed a great deal of dental work. The tonsils were hypertrophied. Small shot-like posterior cervical glands were found, and there was adenopathy of one large and several small axillary glands on the right side. The other findings were practically normal. As there was no change in the vision and as the pathology was unknown, a section of the tumor was taken from the right lid.

The tumor removed from the left cheek several years previously was reported by the pathologist as non-malignant lymph glands. The tumor removed from the lid could not be diagnosed definitely. In some areas it resembled a xanthoma. A week later, when a large part of it was excised, it was found not encapsulated.

The authors state that the condition might have been Mickulicz's disease, multiple xanthoma, or granuloma, but are inclined to regard it as multiple xanthoma complicated by infection.

T. D. ALLEN, M.D.

Patton, J. M.: The Localization and Extraction of Intra-Ocular Foreign Bodies. *J. Am. M. Ass.*, 1922, lxxix, 1030.

The author urges extreme care in diagnosing foreign bodies in the eye, citing several cases of his own in which an X-ray examination was not made for several days because the patient was sure that he had been hit by a very large object or did not remember that he had been hit in the eye. He speaks of Gifford's method of placing a small particle of metallic substance just beneath the conjunctiva close to the limbus before the X-ray plate is made. Another method of localization is the use of a large magnet, but this Patton regards as of questionable value if it is possible to make an X-ray examination.

Before beginning an operation for the extraction of an intra-ocular foreign body, the question of prognosis should always be discussed with the patient as it is much easier at that time to explain the dangers of the operation and the possibility of failure than afterward. As a rule, the patient will be willing to submit to the operation, and then, if the results are unsatisfactory, will feel that everything possible was done to save the eye.

Patton mentions various magnets which are on the market, among them the hand, Haab, and ring magnets. He relates his own experience with the ring magnet.

Patton believes that one should not always enter the eye through the anterior portion nor always through the posterior portion but should be guided by the circumstances of the particular case.

THOMAS D. ALLEN, M.D.

Butler, T. H.: The Influence of Trauma upon the Onset of Interstitial Keratitis. *Brit. J. Ophth.*, 1922, vi, 413.

The author draws the following conclusions:

1. An attack of interstitial keratitis may be precipitated by an accident to a cornea which is predisposed to the disease by syphilis or tuberculosis.

2. It is possible that a very slight trauma such as the instillation of drops or the irritation of a general anæsthetic may have the same effect.

3. The attack in the injured eye may be followed by interstitial keratitis in the uninjured eye.

4. It is possible that an injury to one eye may cause an attack of interstitial keratitis in the other eye.

JAMES P. FITZGERALD, M.D.

Verhoeff, F. H., and Lemoine, A. N.: Hypersensitiveness to Lens Protein. Cataract Operation. *Am. J. Ophth.*, 1922, v, 700.

In previous papers the authors have shown that about 8 per cent of persons are hypersensitive to lens protein, and that when, in such persons, the lens capsule is opened by operation or injury, an intra-ocular inflammation results. Because of the danger of rupturing the lens capsule in the intracapsular operation they suggest desensitizing the patient to lens protein and removing the cataract by discission followed by simple linear extraction. A case in which this was done successfully is reported.

JAMES P. FITZGERALD, M.D.

Hawthorne, C. O.: Observations on the Significance of Retinal Hæmorrhages. *Brit. M. J.*, 1922, ii, 495.

In the author's opinion retinal hæmorrhage may be without clinical significance but when this is true the bleeding is slight, as in certain cases of pneumonia, pyonephrosis, malignant disease of the viscera, mitral disease, etc. He believes that hæmorrhage of this type would be seen more often if routine ophthalmoscopic examinations were made. Other retinal hæmorrhages may be caused by violence such as birth trauma. A third type is the severe retinal hæmorrhage endangering vision, which is not due to violence and is not accompanied by organic disease. The latter Hawthorne discusses in detail, describing particularly the changes in the vascular walls.

Uncomplicated retinal hæmorrhage is of the same character as hæmorrhage occurring in other parts of the body which is not due to violence or any appreciable organic lesion. A variation from the normal rate of blood coagulation will not account for it. The probable explanation is rupture of vessels following damage to their walls, this damage in turn being the result of a change in the quality of the blood or slight violence—perhaps mere changes in the intra-ocular tension—acting on vessels which are particularly susceptible to the destructive influence of mechanical forces.

THOMAS D. ALLEN, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Wojatschek, W.: Polyps of the Base of the Skull (Ueber die Polypen der Schaedelbasis). *Sitzungsb. d. Gesellsch. f. Ohren-, Nasen- u. Halskrankh.*, Petrograd, 1922

The monograph published by Kolyljinskij in 1908 completely exhausted the subject of polyps of the base of the skull up to that time. During the last decade, however, views have changed somewhat and therefore a new critique is necessary. The author discusses the following points:

1. The histologic similarity of the tumors. Usually polyps at the base of the skull are angiofibrosarcomata. In one of the author's cases a marked difference between the peripheral and the central portions of the tumor was evident. In the former the number of cells was greater, suggesting the microscopic picture sarcoma although macroscopically the neoplasm appeared to be an ordinary polyp. Choanal tumors, on the other hand, consist mainly, as is well known, of pure fibrous or œdematofibrous tissue.

2. The operative technique for the removal of polyps at the base of the skull. Of the old methods, the route through the palate and the suprahyoid pharyngotomy of Jeremitsch are the most advantageous as they do not cause disfigurement of the face, but they are not applicable to all cases. Facial methods must be avoided because of the resultant disfigurement. Therefore Denker's proposal to reach the tumor through the vestibule of the mouth and the antrum of Highmore should be accepted for those cases in which the malignant tumor is located in the nasal cavity or the antrum of Highmore. Further experience is necessary, however, to determine whether this route is suitable for the removal of large and deep-seated growths. In one of the three cases operated on by the author by Denker's method there was a recurrence which resulted in death. This was a tumor of the nasopharynx. The route through the palate was used once by the author and the recurrence of the tumor removed later through the cleft in the palate. During the year the patient was kept under observation following the operation no further recurrence developed. The cleft in the palate caused no disturbance of function. In one severe case a Kocher resection of the upper jaw was done. Another case was operated on according to the Hertle method with reflection of the lateral nasal wall.

3. The reports of Kuprijanoff concerning the choice of operative methods in relation to the anthropologic characteristics. In dolichocephalic persons the tumors at the base of the skull are reached more easily through the palate, whereas in brachycephalic persons they are reached more easily through the nose.

4. The classification of polyps at the base of the skull as a condition for the general surgeon or the rhinologist. In the author's opinion the sooner the patient consults a rhinologist the sooner an accurate diagnosis will be made. A recurrence will also be recognized by a rhinologist sooner than by a surgeon. A similar picture is presented by carcinoma of the larynx, the prognosis of which depends upon a timely operation. On the basis of his experience the author comes to the conclusion that the surgical treatment should consist of the most conservative operation possible following early diagnosis.

WALCKER (Z)

Swershewski, L.: Intranasal Cephaloceles (Zur Frage der intranasalen Cephalocelen). *Medic. J.*, 1921, i, 780.

This article is a report of two cases. The first was that of a girl 7 years old. A growth removed by operation from the right nasal cavity was diagnosed on microscopic examination as a cephalocele, but later more thorough examination showed that the structure of the tumor was as complicated as that of teratoid tumors, but with an abundant admixture of glious tissue. The second case was a case of naso-ethmoidal cephalocele in a child 6 years old. Operation was refused.

The author classifies intranasal cephaloceles into three groups: (1) the anterior cephaloceles, that is, the common anterior cephaloceles which have grown through in the form of tumors in the nose; (2) the middle cephaloceles, which penetrate into the nasal cavity through the lamina cribrosa; and (3) the posterior cephaloceles which may extend into the nasopharyngeal space and the posterior parts of the nose. The first group offers no diagnostic difficulties. The diagnosis of those of the second group is more difficult as usually they resemble polyps or tumors growing from the upper nasal passage. The early appearance and slow growth of the tumor, the displacement of the nasal septum, and the one-sidedness of the process are valuable diagnostic features. A certain diagnosis can be made only on the basis of microscopic examination and an outflow of cerebrospinal fluid when an attempt is made to remove the growth partially. The posterior cephalocele is usually associated with other congenital changes in the skull and the brain.

The prognosis of anterior and middle cephaloceles is good but that of the posterior forms is less favorable.

In cases of anterior cephaloceles the extirpation of the tumor followed by plastic closure of the bone defect comes up for consideration. In cases of

middle cephaloceles a waiting policy should be adopted, if non-suppurative complications set in the growth should be removed intranasally, but if suppurative complications develop and there is escape of cerebrospinal fluid, extranasal opening of the nasal sinuses with plastic closure of the bone defect is indicated. Posterior cephaloceles are inoperable. VON HOLST (Z).

THROAT

Bjalo, D.: Resection of the Superior Laryngeal Nerve in Tuberculosis of the Larynx (Ueber die Resektion des N. laryngeus sup. bei Larynxtuberkulose). *Tuberkulose*, 1922, i, 12.

As the author was unable to decrease the pain and cough of laryngeal tuberculosis with the usual surgical measures, he decided to try radical treatment in the form of resection of the superior laryngeal nerve. In the beginning, he applied the operation only to serious or hopeless cases, but as he became convinced of the ease of the technique, he tried it also in light cases which were not benefited by curettage and the use of the galvanocautery. Altogether, twenty-five resections of the superior laryngeal nerve were done (twenty patients; bilateral resection in five cases). In seven cases the condition was unilateral.

The superior laryngeal nerve may be exposed from within through the larynx or pharynx or from without by way of the neck. In the latter procedure it may be sought through a horizontal incision running parallel with the border of the thyroid cartilage or through a vertical incision along the border of the sternocleidomastoid muscle. The author prefers the horizontal incision.

The operation is done under local anæsthesia induced with a 1 per cent cocaine-adrenalin solution or a 2 per cent novocaine-adrenalin solution. Only the neurectomy itself causes pain. In some cases the pain radiates into the ear (four times in twenty-five cases). Occasionally the search for the superior laryngeal nerve is difficult, especially when the space between the hyoid bone and the upper border of the thyroid cartilage is narrow. Moreover, the surgeon may mistake the border of the hyoid bone for the border of the thyroid cartilage and may penetrate at a higher level than necessary, reaching the hypoglossal instead of the superior laryngeal nerve.

After the operation the nearby lymph glands of the neck and the submaxillary glands become swollen, but the swelling disappears in the course of a few days. Occasionally the arytenoid and the aryepiglottic folds also swell. Swallowing the wrong way, which usually occurs in patients operated upon, is a serious complication.

In the author's cases the excruciating pain disappeared entirely after the operation and there were no recurrences in the four or five months during which he kept the patients under observation. Anæsthesia of the larynx results from the resection of the superior laryngeal nerve; paræsthesia and motor disturbances of the vocal cords were never observed. As the tactile sense remains normal even after bilateral division of the superior laryngeal nerve, the inferior laryngeal nerve or the rami communicantes which unite it to the superior laryngeal nerve must contain sensory fibers in addition to motor fibers.

In the author's opinion resection of the superior laryngeal nerve is necessary in cases of severe dysphasia in which other remedies cause no improvement. In cases of unilateral development of the tuberculosis it may effect a cure. Energetic local treatment may be undertaken afterward. It is not a dangerous procedure.

Simple resection of the superior laryngeal nerve by Hoffmann's method does not give permanent results; therefore it is better to inject alcohol into the exposed nerve.

The article is supplemented by an extensive bibliography. WALCHER (Z).

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SURGERY OF THE EYE AND EAR

Eye

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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Malignant disease of the soft palate; removal by simple excision; preliminary ligature of the external carotid artery. A. Ryland. Proc. Roy. Soc. Med., Lond., 1922, xv, Sect. Laryngol., 50.

INTERNATIONAL ABSTRACT OF SURGERY

FEBRUARY, 1923

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Taylor, F. B., Terry, W. I., and Alvarez, W. C.: Improvements in Pre-Operative and Post-operative Care. *J. Am. M. Ass.*, 1922, lxxix, 1578.

In a group of 211 patients, of whom 146 had had a laparotomy and 65 an extra-abdominal operation, the authors studied the incidence of pain and vomiting in: (1) those who had been purged before and after operation, (2) those who had not been purged before but had been purged shortly afterward, and (3) those who had not been purged before and who were given no enema or cathartic for at least four days after operation.

The omission of the pre-operative purge had no definite influence on the vomiting, but reduced the incidence of pain in abdominal cases from 75 to 42 per cent. Delay in giving the postoperative purge reduced the incidence of vomiting from 45 to 30 per cent in the abdominal cases and from 20 to 4 per cent in the others. In both groups there was more complaint of pain when the postoperative purges and enemas were withheld. Hence, a number of patients will be more comfortable if given enemas as soon as they are needed to aid in the expulsion of gas.

The authors conclude that cathartics should be withheld for as long after operation as possible. Of twenty patients not given a purge or enema for six days after operation none showed ill effects and several had spontaneous bowel movements. In the other cases an enema on the sixth day was effectual.

WALTER C. BURKET, M.D.

Mayer, A.: Postoperative Adhesions in the Abdominal Cavity (Ueber postoperative Adhaesionen in der Bauchhoehle). *Zentralbl. f. Gynaek.*, 1922, xlvi, 940.

Sixty secondary laparotomies after gynecological operations showed the following results:

1. Of sixty cases of gynecological laparotomy, fifty-two (87 per cent) showed adhesions and eight (13 per cent) showed no adhesions.

2. Of thirty-seven cases operated on for the first time outside of the clinic, thirty-seven (100 per cent) showed adhesions, and of twenty-three operated on for the first time in the clinic, fifteen (65 per cent) showed adhesions and eight (35 per cent) showed no adhesions.

The development of adhesions is dependent upon imperfect asepsis, incomplete hæmostasis, and inaccurate peritonization of the stumps. The author does not accept the theory that there is a predisposition to the formation of adhesions at certain periods of life, or that adhesions are favored by a peculiar constitution such, for example, as the asthenic habitus of Stiller. A striking fact in the cases reviewed was that in those in which pregnancy occurred between the laparotomies there were no adhesions.

In addition to perfect asepsis, accurate hæmostasis, and good peritonization, the following factors have been suggested as of importance in the prevention of postoperative adhesions: (1) the avoidance of painting the abdominal walls with iodine, (2) the infusion of humanol, and (3) the production of a pneumoperitoneum at the close of the laparotomy. Mayer, however, has no objection to the use of iodine. With regard to the introduction of humanol he states that this has been done for many years, but decisive results have not been seen and adhesions were demonstrable in subsequent examinations with pneumoperitoneum and roentgenography even when there was no complaint of their presence. The production of a pneumoperitoneum at the end of the laparotomy was considered by Mayer but not carried out.

In conclusion, attention is called to the difficulty in the diagnosis. Frequently there are symptoms of adhesions in the absence of adhesions, but there may be also adhesions without symptoms. The importance of the demonstration of postoperative adhesions with the aid of pneumoperitoneum and the X-ray is brought out with the aid of six very instructive illustrations.

HEIDLER (Z).

ANÆSTHESIA

Rost, F., and Ellinger: Why Is the Escaping Blood Dark Colored in Too Deep Narcosis? (Weshalb ist bei zu tiefer Narkose das ausfliessende Blut dunkel gefaerbt?) *Muenchen. med. Wchnschr.*, 1922, lxix, 772.

During operation under narcosis it is not very unusual to see the blood suddenly turn dark, even when there is no obstruction to respiration. The authors studied this remarkable phenomenon in experiments on cats and found that it is due to methæmoglobin.

This methæmoglobin could be demonstrated in pure ether narcosis, in chloroform narcosis, and in mixed hydrogen narcosis. Because of these findings the authors are inclined to attribute the occasional appearance of hæmoglobinuria and the anæmia observed after repeated narcosis to the breaking down of the red blood corpuscles with thrombosis in the internal organs. The formation of methæmoglobin does not take place during narcosis of short duration, even when a comparatively large quantity of anæsthetic is used. Methæmoglobin remains demonstrable in the blood for some time, but at the end of twenty-four hours has usually disappeared.

DEES (Z.)

Behrendt: The New Anæsthesia Procedure of Gauss and Wieland (Das neue Betaeubungsverfahren nach Gauss und Wieland). *Zentralbl. f. Gynæk.*, 1922, xlvi, 1220.

As claimed by Wieland, acetylene produces effects similar to those of laughing gas. Experience with it in 220 cases is reported. Acetylene mixed with oxygen is used. Anæsthesia is produced in from one to five minutes and the awakening occurs still more quickly. Unconsciousness, anæsthesia, and relaxation of the abdominal wall are obtained with a suitable mixture. The heart and respiration remain uninfluenced but the blood pressure rises somewhat. Salivation is prevented by morphine and scopolamine. Nausea does not develop. According to experience up to the present time, this anæsthetic is harmless.

KELLENKAMPFF (Z.)

SURGERY OF THE HEAD AND NECK

HEAD

Friedland, M. O.: Surgical Operations on Gunshot Wounds of the Skull and Its Contents During the War, 1914–1917 (Ueber chirurgische Eingriffe bei Schusswunden des Schaedels und seines Inhalts nach den Kriegserfahrungen 1914–1917). *Kazan. Med. J.*, 1921, i, 91.

A series of sixty cases of penetrating gunshot wounds of the skull are reported, thirty-eight of which were operated upon by the author and twenty-two by other surgeons. An exploratory incision is indicated in every case of uncertain diagnosis; if the bone is found to be intact, nothing further should be done. Small splinters of the lamina vitrea heal in smoothly in the presence of an intact external layer of bone.

When there are fissures penetrating the entire thickness of the bone, exploratory trephining is indicated. One or two trephine openings 3 to 4 mm. in diameter make possible the examination of the lamina vitrea, the dura, and the subdural space (hæmatoma). If necessary, the trephine opening may be enlarged with a chisel.

In encephalitis and suppurative meningo-encephalitis the trephine openings must be large. In ten cases of encephalitis and meningo-encephalitis there were seven deaths. The clinical picture of acute suppurative encephalitis is very typical. After a comparatively long period of well-being, protrusion of the brain occurs with a high temperature and slowing of the pulse. The necrotic masses are then thrown off and the general condition improves, but after a few days or weeks there is an aggravation of the condition, the high temperature and slowing of the pulse return, the protrusion enlarges, necrotization occurs in the center, and paresis supervenes. This is again followed by improvement and again by aggravation, the necrotization of the brain increasing in circumference, and coma and death occurring after three to five recurrences. The foreign body is frequently the cause of the progressive encephalitis.

Of twenty-two patients, eleven recovered, three were benefited, and eight died. According to the statistics regarding 100 persons with injuries of the head, forty-three died on the battle field, forty-eight died in hospitals along the line of evacuation, two died in the reserve hospitals, and only seven survived.

GREGORY (Z.)

Lillie, H. I.: Infection of the Sigmoid and Lateral Sinus: Report of Nineteen Cases. *Surg., Gynec. & Obst.*, 1922, xxxv, 418.

The author reports a series of nineteen cases of infection of the sigmoid and lateral sinus observed at the Mayo Clinic during the past five years. These were selected from a series of more than 500 cases of mastoid disease in which operation was performed and more than 150,000 miscellaneous cases examined in the Ear, Nose, and Throat Section. The patients have been divided for discussion into four groups:

Group 1. Patients with involvement of the sigmoid sinus by phlebitis or non-obliterating thrombosis.

The jugular vein was not operated on primarily in any of the eight cases in this group. In three cases subsequent ligation was necessary because of the patient's condition.

The leucocyte count was relatively high except in three cases; in two, the condition was really leucopænia. One patient was extremely ill and had a

very virulent infection of the blood stream due to hæmolytic streptococcus.

Blood cultures were positive in four cases, while in one, that of a patient most critically ill, cultures were repeatedly negative. No two patients were infected with the same organism and no regular interval elapsed before the blood culture became negative.

The temperature was fairly typical of sepsis in five cases, and in three the patient was almost afebrile.

Choked disc occurred in three cases, being probably the result of general toxæmia. Blood transfusion was used in three cases as a supportive measure.

Two patients who were most critically ill had phlebitis without thrombosis.

Group 2. Patients with obliterating thrombosis. Of the seven patients in this group a primary operation was performed on the vein in two because bleeding did not occur from the bulb end of the sinus. In three cases the operation was performed on the vein secondarily because symptoms and signs of sepsis developed during the postoperative course and at the second operation bleeding did not occur from the bulb end. In one case the disturbance may not have been recognized at the primary operation. In the other two it may have resulted from injury to the sinus wall. In two cases, in which the vein was not disturbed, the patient had an uneventful convalescence. The blood counts were not high even in the presence of infection in the blood. The patient's general appearance seemed to be the best index of his condition.

In six cases the blood cultures were positive; in one case no culture was made. The patients were all infected with different organisms. The temperature curve was quite characteristic in four cases, and in one it was definitely misleading. Two patients were nearly afebrile. Choked disc occurred in one case. This patient was given a transfusion because of low hæmoglobin and the effect was immediately beneficial. In general, it may be said that the patients in this group were not so extremely ill as those in Group 1. In no case was the vein resected.

Group 3. Patients who died without submitting to operation. The two patients in this group were so extremely ill and the infection was so overwhelming that operation was not attempted. A septic sore throat in one case made it difficult to determine the true source of the sepsis, even in the presence of the ear suppuration. The other patient became mentally disturbed. The soft parts discolored when handled, and the site of the needle puncture for the blood culture began to slough in twenty-four hours.

Group 4. Patients who died and in whom the disease was not recognized clinically. Of the two patients in this group, one showed the result of septicopyæmia, operation having been delayed too long. The ear was examined two days before death and the history was typical, but sinus infection was not suspected because the patient was in extremis. After the patient had died the home physician gave the history of previous chills and high fever. The injected guinea pig died of miliary tuberculosis. The patient's blood was positive for hæmolytic streptococcus.

The other patient had a thrombosis of the straight sinus which probably accounted for symptoms suggesting brain abscess. Headache, drowsiness, and mental apathy may be caused by circulatory changes secondary to thrombosis of the straight sinus.

The author draws the following conclusions with regard to the treatment of involvement of the sigmoid and lateral sinus.

1. Patients should be treated individually rather than by one routine surgical procedure.

2. Primary operation on the jugular vein is not indicated unless bleeding does not occur from the lower end of the sinus.

3. The operation on the vein may be safely delayed if both ends of the sinus bleed freely. In none of the cases was the vein resected.

4. Too much dependence must not be placed on laboratory findings. The patient's general appearance is a fairly reliable index of his condition.

5. Blood transfusion by the citrate method, with care to group the patient properly, is a valuable supportive measure.

6. Unnecessary handling and examination should be avoided as they may interfere with convalescence.

7. Forced feeding, quiet pleasant surroundings, and cheerful nursing are important factors.

8. Patients with lung complications may recover.

9. Thrombosis of the straight sinus may cause symptoms and signs of brain abscess.

10. The prognosis may be regarded as fairly good if well-directed measures and timely surgical interference are employed. F. K. Hansel, M.D.

Reverchon, L., and Worms, G.: Spontaneous Occipital Pneumatocele of Mastoid Origin; Operation; Recovery (Pneumatocèle occipitale spontanée d'origine mastoïdienne; opération; guérison), *Bull. et mém. Soc. de chir. de Par.*, 1922, xlviii, 997.

The author's case was that of a soldier aged 21 years who had a depression the size of a fifty-cent piece in the right occipital region. Complaint was made of headache which began about six months after a slight fall on the head without immediate serious results. A few months later the depression gave place to a tumefaction which increased slowly to the size of a mandarin orange. The swelling showed no signs of inflammation and was clearly an air cyst. It increased in size on effort and could be reduced by pressure. The X-ray examination showed the entire mastoid region to be filled with air. The vacuolar aspect was continued also over a considerable extent of the conchal and the petrous portions of the temporal bone and the parietal and occipital zones. The mastoid on the opposite side showed similar cavities.

A large incision was made over the tumor and an osteoplastic operation filling the osseous breach with osteoperiosteal fragments was done. The bottom of the cavity was formed by the internal table which was very irregular. The air collection was clearly subperiosteal. A tunnel communicating with the mastoid cavities was found.

In the authors' opinion there had been a spontaneous dehiscence of the external table which was thinned by the process of pneumatization and distended mechanically. The part played by the patient's fall on his head is problematic. The process was exclusively intra-osseous and probably connected with some defect in development. The pneumatization of the mastoid was probably the direct cause of the pneumatocele.

Auvray collected fifteen cases of frontal, and thirteen cases of mastoid, pneumatocele. The authors find that to date, including their own case, only twenty-nine cases of mastoid pneumatocele have been reported. W. A. BRENNAN.

Ricaldoni, A.: Infantilism of the Hypophyseal Type and the Argyll-Robertson Sign Associated with a Tumor of the Thalamic Part of the Third Ventricle Infiltrating the Optic Layers But Not Invading the Infundibular or the Hypophyseal Regions (Infantilisme du type hypophysaire et signe d'Argyll-Robertson avec tumeur développée au niveau de la partie thalamique du troisième ventricle et infiltrant les couches optiques, mais n'envahissant pas la région de l'infundibulum ni l'hypophyse). *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1922, xlvi, 1238.

The case reported by Ricaldoni again raises the question regarding the symptoms which must be attributed to functional disturbances of the hypophysis and the infundibular region. The patient was a boy of 18 years with infantilism of the hypophyseal type and diabetes insipidus. Growth had been arrested since the thirteenth year, and for the past two years there had been intense thirst. Constant polydipsia was associated with the daily elimination of from 2,500 to 4,000 c.cm. of urine. The only eye sign was the Argyll-Robertson pupil. Constant intense headache, predominantly occipital, was associated with vomiting. Death resulted. Lumbar puncture on the day of death showed that the cerebrospinal fluid contained urea, albumin, and lymphocytes. Polyuria persisted to the end.

At autopsy a tumor adherent to the lateral walls was found in the superior thalamic part of the third ventricle. The growth reached its maximum in the optic layers, especially the right. Histologically the tumor was a round-celled sarcoma or perhaps a gliosarcoma.

The hypophysis was found to be macroscopically normal; histologically there was no trace of neoplastic infiltration but there were some slight hæmorrhagic and lymphocyte invasion in the posterior lobe, especially in the central part. The pars intermedia, the stalk of the hypophysis, and the infundibular region showed no changes.

Pressure from the tumor was exerted upon the trigone and the corpus callosum. The diabetes insipidus might have been the result of the secondary and indirect lesions of the posterior lobe of the hypophysis or of compression of the infundibulum consecutive to disturbance of the circulation or ventricular hydrops.

The arrest of development establishes once again the fact that so-called hypophyseal disturbances may occur without any direct participation of the hypophysis itself and with very diverse encephalic localizations of neoplasms, although usually the latter are di-encephalo-mesencephalic. The anterior lobe of the hypophysis showed very little involvement.

The Argyll-Robertson sign in this case was quite independent of syphilis, all tests for this condition being negative. W. A. BRENNAN.

Silbert, S.: A Case of Brain Abscess of Unusual Etiology. *J. Am. M. Ass.*, 1922, lxxix, 1427.

Silbert reports a case of brain abscess resulting from the direct introduction of an infected foreign body into the brain.

Six weeks before his admission to the hospital, the subject, a boy aged 6 years, stumbled and fell on a stick. The resulting small wound on the left side of the face became infected and discharged considerable pus but healed in eight days. Four weeks before he entered the hospital the child began to complain of headache and had some fever. Three days before his admission the headache became so severe and the fever so high that he was put to bed. He then became delirious. When he was brought to the hospital he was in a moribund condition. His head was retracted and there was marked opisthotonos. The right pupil was larger than the left, and both reacted sluggishly to light. There was marked stiffness of the neck and a bilateral Kernig sign.

Autopsy showed a small, firmly healed wound about 1 cm. in length on the left side of the face midway between the outer angle of the orbit and the external auditory meatus. On removal of the skull cap and reflection of the dura, the surface of the brain was found to be covered by a thick purulent exudate. The left temporal lobe showed marked flattening of the gyri, and fluctuation was noted on palpation. Under this area was a large abscess cavity filled with thick purulent material. The dura overlying the abscess showed a perforation, and a probe introduced into this opening led directly through a similar perforation in the squamous portion of the temporal bone to an abscess under the temporal muscle. In this tract several splinters of wood were found. H. A. MCKNIGHT, M.D.

Partsch: The Reconstruction of the Inferior Maxillary Arch by Autoplasty (Wiederherstellung des Kieferbogens durch Autoplastik). *Zentralbl. f. Chir.*, 1922, xlix, 989.

The peculiar anatomical relationships of the inferior maxillary arch make healing difficult. As com-

pared with the peg method and the interpolation method Partsch believes the graft method with splitting open of the fractured ends is safer and more convenient because in the most varied positions of the fractured ends it makes possible the approximation of freshly bleeding bone surfaces, a condition favoring rapid agglutination and healing if chips from the crest of the ilium are used in the implantation.

In fifty-five of seventy-six cases operated upon complete healing-in of the implant occurred. The numerous cases re-examined after several years demonstrated that the implant grows and unites completely with the arch of the inferior maxilla. A transplant examined histologically at the end of three weeks showed no regressive changes and presented fresh bony sprouts over its entire surface.

VALENTIN (Z).

Davis, W. B.: Harelip and Cleft Palate Deformities; Some of the Types and Their Operative Treatments. *Ann. Surg.*, 1922, lxxvi, 133.

Complete and incomplete unilateral harelip generally require the same plan of treatment. In the latter there is usually very little or no muscle tissue between the upper angle of the cleft and the floor of the nostril. Incomplete clefts are converted into complete clefts.

In outlining incisions for the correction of harelip the method devised by Thompson has been found the most satisfactory. With sharp-pointed calipers the distance is measured from the mid-point of the floor of the nostril to approximately the point in the same sagittal plane to which the free margin of the lip would come if it were normal. The upper point of the calipers being kept in place, the lower is rotated laterally to the vermillion border where a mark is made on each side. Incisions carried through the entire thickness of the lip at a right angle to the skin surface and following the lines outlined will give surfaces for approximation. Before approximating the margins the upper lateral portions of the lip should be freed from the maxillæ.

In complete single harelip and cleft palate cases the lip and alveolar cleft should be operated on first, usually between the tenth day and the third month. The cleft palate may be closed between the twelfth and the twentieth months.

A wide alveolar cleft is repaired by partially dividing the buccal side of the alveolar process, just posterior to the canine region on the opposite side. A greenstick fracture is then produced and the edges of the cleft are brought together after they have been denuded of mucous membrane. The margins are held by means of a silver wire.

Closure of the remaining cleft of the palate is done by the Langenbeck mucoperiosteal flap-sliding method. An additional flap may be taken from the lower edge of the vomer if necessary. The margins of the flaps are approximated with interrupted sutures of No. 00 wire, as far back as the soft palate where one on-end silk mattress is used. The remaining part is closed with black silk.



Application of the Thompson method of determining the points for the lines of incision for the correction of harelip

In bilateral harelip cases the wide separation of the margins necessitates more extensive freeing of the lip from the alveolar process. Stay sutures of silkworm gut are used to relieve tension.

Incomplete union in the hard palate may be repaired by any one of three methods: (1) by making lateral incisions just within the alveolar process on each side, loosening the flaps, and approximating them in the midline, as in the Langenbeck operation; (2) by the Lane flap method; or (3) by bringing part of the horizontal processes of the maxillæ and palate bones medially with their attached soft tissues.

FRENCH K. HANSEL, M.D

Veau, V.: Operative Treatment of Complete Double Harelip. *Ann. Surg.*, 1922, lxxvi, 143.

The author reports a series of thirty-five cases of complete double harelip operated upon for the first time or retouched.

The premaxilla should not be excised as its preservation gives a projection to the upper lip. Veau operates first upon the lip, correcting the palate later. He closes the lip by two operations, first by pulling back the premaxilla, and second, by suturing the soft parts. The premaxilla is operated on at the age of two or three months and the lip is sewed one or two months later. The palate may be closed during the second year.

In the first operation the septum obstructs the pulling back but the projection of the nose depends upon its integrity. An incision about 2 cm. long is made behind the premaxilla along the lower edge of the septum and the periosteum elevated. A wedge of bone is removed with the forceps as shown in Fig. 1 and the premaxilla displaced downward and backward.

The lateral edges of the premaxilla should be trimmed off before the displacement is effected. It is fixed into position by means of silver threads passed into the maxilla and the premaxilla on each side. In bringing parts of the lip together a complete restoration is not attempted, the object being only to form a bond of the soft parts in front of



Fig. 1. Septum of a three-months-old child with a complete double harelip.



Fig. 3. Suture of the skin completed.



Fig. 2. Second operation. The skin incisions.



Fig. 4. Suture of the mucous membrane. Note the manner in which the philtrum is included in the suture.

the drawn-back premaxilla. This means of fixing the premaxilla is much more important than the deep ligation with the silver threads. The two mucocutaneous edges are freshened and the skin is sutured. One large tension suture is put on the under surface.

The restoration of the lip is done in two operations. The qualities of a well-restored lip are: (1) suppleness of the cutaneous parts; (2) rectangular mucocutaneous lines; (3) vitality of the muscles or philtrum to insure the continuity of the orbicular; (4) projection of the mucosa without a notch in its lower edge; and (5) normal contour.

In the reconstruction of the lip the skin, muscle, and mucosa must be taken into consideration.

The incision in the skin should be away from the mucosa to avoid the piece of mucous membrane that remains. The lip is nearly always too high because subsequently the atrophied philtrum becomes larger.

The muscles should be brought together carefully to give suppleness to the lip.

The chief fault of the classical operation for the repair of the mucous membrane is removal of the mucosa of the philtrum. It is the lack of mucous membrane that causes flattening of the lip.

The technique of making the skin incisions is shown in Fig. 2. The line *c–b* is traced with great care. It passes away from the mucous membrane part and only through the skin. The angles *b* and *c* are very clearly cutright angles.

At the level of the lower edge of the philtrum all of the muscle is conserved.

The cutting of the lateral part is done in the line *e–f* which includes all of the mucous membrane and about 2 mm. of skin. It must be perpendicular in the direction of the lip. The incision will include the inner and outer mucous membrane.

When the bistoury arrives at the *f* it makes the line *f–g* which is 3 mm. long. This approaches the muco-cutaneous line, but does not cut it.

The line *g–h* is drawn obliquely in leaving the mucous membrane.

The part included between the points *b*, *a*, *f* is removed with care to penetrate into the nostril in order to diminish the spreading of the nose. The result after the skin has been sutured is shown in Fig. 3.

In suturing the muscles the finest catgut is used. Vascular silk is employed in the skin. In sewing the mucous membrane the finest horsehair is used.

The lower part of the philtrum, which is situated behind, must be sewed as shown in Fig. 4.

FRENCH K. HANSEL, M.D.

Pichler, H.: A Large Operative Defect in the Pharynx Covered by Primary Transplantation of Skin Flaps (Grosser operativer Defekt im Rachen durch primaere Transplantation von Oberhautlaeppchen gedeckt). *Zentralbl. f. Chir.*, 1922, xlix, 1070.

After removal, by way of the mouth, of a squamous-celled epithelioma involving the left half of the soft palate, the tonsil, and the left base of the tongue, the lower part of the wound in the region of the tongue was covered by a Thiersch graft taken from the inner side of the upper arm. The flap was pressed into place by means of a rubber upper dental plate and a lump of dental compound to which it had been made fast with mastisol with its wound surface on the outside.

Healing was uncomplicated, and at the end of four days the grafts had healed in over almost all of the wound. This procedure, which Pichler applied to the soft palate in two previous cases, is based on the conversion of the flat wound, in which the fixation of Thiersch flaps is impossible in the mouth, into a cavity wound KEMPF (Z)

NECK

Tinker, M. B.: The Desperate Risk Goiter. *J. Am. M. Ass.*, 1922, lxxix, 1291.

This report is based on 1,000 cases selected from a series of 1,318 which were under observation from May, 1914, to May, 1921.

The author has found that persons with obstinate gastro-intestinal symptoms, hypertension, and myocardial insufficiency are especially desperate risks. When nausea and vomiting apparently resulted from thyroid toxæmia alone and resisted treatment, the patient died. These cases are relatively rare but Tinker has seen four. For the past ten years he has not operated on cases with marked gastro-intestinal symptoms. He does not consider as favorable for operation any patient with hypertension whose pressure cannot be reduced thirty points, and he has not operated on any with a pressure over 190. Preliminary medical treatment is of greatest importance in these cases and local anæsthesia is safest for operation. In cases with myocardial insufficiency digitalis should be pushed to effect. This, with general care, usually brings such improvement that operation is comparatively safe. Glycosuria with hyperthyroidism is a serious combination. When it is possible to get the patient sugar-free he progresses relatively well after thyroidectomy and frequently remains sugar-free without a very strict diet.

Local anæsthesia is indispensable in the removal of goiters causing obstruction to respiration. The author does not accept the statement that any case of malignancy of the thyroid which is so far advanced that diagnosis is possible is hopeless for operation. Two of his cases of this type have remained cured, one, eight years, and one, more than ten years after the excision of extensive malignant processes involving the great vessel sheath, the larynx, and the trachea as well as the thyroid.

In conjunction with the metabolic rate and tachycardia Tinker attaches considerable importance to lymphocytosis in determining the risk in doubtful cases. He advocates preliminary ligation and in the cases of extremely toxic patients who come to operation wide awake in spite of preliminary preparation with morphine-scopolamine, the elimination of the

psychic element by light nitrous oxide-oxygen anæsthesia combined with local anæsthesia. The many-stage operation which can be stopped and the wound packed with gauze whenever there is doubt as to whether it can be safely completed is not ideal, but will save life in desperate cases. Tinker does not advocate the use of radium or the X-ray in the treatment of hyperthyroidism. S. J. Seeger, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Bloodgood, J. C.: Tumors of the Breast. *Northwest Med.*, 1922, xxi, 338.

After thirty years of investigation the author finds tumors of the breast as fertile a field for study as ever. The problems are: (1) to give the patient with cancer the best chance of cure, (2) to save the breast in cases of benign tumor, and (3) to determine the cases in which operation is contra-indicated entirely. Formerly Bloodgood felt that he was confronted with a diagnosis which called for no operative interference in less than 2 per cent of breast cases but today finds operation indicated in only 50 per cent of cases. Thirty years ago a majority of cases had a definite lump and in 90 per cent the lump was malignant.

A discharge of blood from the nipple is not of itself a sign of cancer, and the breast should not be removed because of this symptom alone. Pain in the breast is not a sign of cancer when it is unassociated with other evidence.

Lactation leaves its effect on the breast in dimples which may be mistaken for evidence of cancer. A small tumor which is visible in a moderately normal breast is usually malignant. The average breast is lumpy. It is most lumpy at puberty and very lumpy during pregnancy.

In surgical exploration of a tumor the author cuts down on the tumor instead of excising it. In doubtful cases the diagnosis must be made at the time of operation by inspection and frozen section. The working rule when there is doubt as to the character of a tumor is to do the complete operation for cancer. In cases of blue-dome cyst the cyst alone should be excised even if in cutting it out other cysts and dilated ducts are encountered. Failure to find a palpable lump easily when cutting down is suggestive of malignancy. S. J. Seeger, M.D.

HEART AND VASCULAR SYSTEM

Mills, H. W.: Hydatid Cysts of the Heart; with Report of a Case. *Surg., Gynec. & Obst.*, 1922, xxxv, 455.

The case reported was that of a woman 36 years of age who was found dead. Autopsy revealed a hydatid cyst of the right ventricle 5 cm. in diameter which showed the typical laminated cyst wall. No daughter cysts or scolices were found. In the substance of the right lung on the inner side of the lower lobe were four cysts the size of walnuts. The left lung was normal.

A primary hydatid cyst of the heart is formed by an embryo which has surmounted both the hepatic and pulmonary defences. Because of its location this cyst ruptures early. The primary rupture is usually not fatal and passes unnoticed. Secondary metastases in the lungs or brain result from flooding of the venous or arterial circulation with hydatid sand, i.e., brood capsules and scolices. Hydatid cyst of the heart has never been diagnosed during life. H. A. McKnight, M.D.

Dshanelidze, I. I.: A Case of Suture of a Puncture Wound of the Ascending Aorta [Ein Fall von Naht einer Stichverletzung der Aorta ascendens]. *Manuskript*, Petrograd, 1922.

The author's case represents the first operation for puncture wound of the ascending aorta.

The patient, a laborer 20 years of age, was brought into the hospital in an intoxicated condition with a large number of incised wounds on various parts of his body. His pulse was 92. The heart boundaries and dull areas were normal. There was no pneumothorax or hæmothorax.

The wounds on the temple and wrist were sutured. At the left of the sternum, at the level of the first intercostal space and the second rib, was a wound 3 cm. long. When this was held open, a 3-cm. bleeding wound of the sternum was exposed.

The patient's condition grew progressively worse. One hour after admission a peculiar sound was heard on auscultation of the heart, respiration was disturbed, and there was a tympanic sound at the site of cardiac dullness. Signs of an accumulation of blood and air in the pericardium were noted which suggested an injury of a blood vessel within the pericardium. The site of the external wound indicated an injury of the ascending aorta, the pulmonary aorta, or the heart.

The patient was operated upon under ether anæsthesia eight hours after the injury. The wound was enlarged downward and to the left with the formation of a skin and muscle flap and the resection of pieces of cartilage from the second and third ribs and of a piece of the sternum. The layers of the pleura, which were uninjured, were pressed to one side with a blunt instrument. The wound was found to penetrate the fatty tissue of the mediastinum. When the pericardium was split lengthwise, blood, bubbles, air, and froth were evacuated. The right auricle and the site of emergence of the aorta were then exposed, on the right the pulmonary aorta was visible. On the anterior surface of the aorta, 1 cm. from the heart, and situated at an angle to the longitudinal axis of the aorta was a wound

8 mm. long from which blood flowed in a thin stream. When the second suture was attempted there occurred from the puncture channel heavy bleeding which could not be stopped by tamponade for two minutes and led to the formation of a hæmatoma under the adventitia. Two more button sutures, which included the hæmatoma, caused complete hæmostasis. The sutures in the aorta held well. The pericardium was washed out and sutured. Uneventful healing followed. During the first few days following the operation the temperature went up to 38.1 degrees C. The pulse was 100–104. At the end of four weeks the patient was discharged cured.

The author refers to the work of Perthes published in 1897, in which were cited twelve cases of wounds of the aorta not followed immediately by death. He considers it both possible and necessary, however, to treat wounds of the aorta at once. He points out the difficulty in diagnosing this type of injury as well as injuries of the heart, and states that only the situation of the external wound, the peculiar sound, the progressive deterioration of the patient's general health, and the respiratory difficulty in the absence of signs of injury to the lungs, led him to suspect an injury to the organs within the pericardium and to operate.

In the exposure of the heart the author favors progressive widening of the channel of the wound with resection of the ribs and of as much of the sternum as necessary. On the basis of five cases of cardiac injury on which he operated with favorable results, he recommends complete closure of the pericardium and the pleura; if possible, an extrapleural operation should be done.

In the case of injury to the aorta which is reported there were a number of circumstances which favored a good result. The wound was small and partly protected by a thrombus which prevented severe bleeding, the sutures held well, and an extrapleural operation was possible. SCHAACK (Z).

MISCELLANEOUS

Kessler, E. H.: Diaphragmatic Hernia—Non-Traumatic: With a Report of Four Original Cases. *J. Missouri State M. Ass.*, 1922, xix, 461.

Congenital diaphragmatic hernia is infrequent. Its clinical history may so simulate that of other conditions that it may not be diagnosed during life. Imperfect development is probably the primary factor.

The hernial opening may be at any point in the diaphragm. The author had two cases with abnormally large openings for the œsophagus and two cases with openings through the dome of the diaphragm. Cases have been reported also in which the opening was in the right or left side of the diaphragm.

Pain is usually present in the chest. The percussion note is resonant and the breath sounds are absent. There may be dyspnœa, regurgitation of food, or vomiting. Gastro-intestinal symptoms may be absent. The chest shows no change in appearance.

The hernia may become partially strangulated. Viscera may pass into and out of the thoracic cavity. The condition is not fatal unless strangulation occurs. The X-ray is the important factor in the diagnosis.

Few cases are found in the literature. The author reviews those reported during recent years. Most of them were diagnosed by the X-ray or at postmortem examination.

Case 1. A man, aged 27 years, had always been troubled with shortness of breath. This was especially noticeable after eating. A feeling of oppression or of pain in the epigastric region followed a heavy meal or the drinking of a large quantity of fluid. There was no history or sign of injury. The chest and abdomen appeared normal. The breath sounds were absent in the lower left chest. The condition was diagnosed as pneumothorax. X-ray examination showed an enlarged œsophageal opening in the diaphragm and the presence of about half of the stomach in the chest.

Case 2. The patient was a man 29 years of age who complained of shortness of breath and irregular heart action with pain which was brought on by exertion and heavy meals. There was no history or sign of injury. The chest and abdomen appeared normal. X-ray examination showed displacement of the heart toward the right, the presence of about one-fourth of the stomach in the chest, and an opening in the diaphragm 2 in. from the œsophagus.

Case 3. A man, aged 49 years, complained of a feeling of fullness and occasionally an acute pain in the epigastrium after meals. The attacks of pain were associated with marked dyspnœa. Vomiting usually gave relief. There was no history of injury. X-ray examination showed one-half the stomach in the chest.

Case 4. The patient, a woman, aged 62 years, for many years had had a feeling of fullness after eating, and retrosternal pain which was relieved by vomiting. The first meal of the day seemed to cause the most severe pain. X-ray examination showed that the stomach had entered the chest through the œsophageal opening. Under the fluoroscope the barium first appeared above the diaphragm and caused acute distress. It then began to pass below the diaphragm, taking the stomach with it. In twenty minutes the stomach was in its normal position. Two years after the operation the patient was still in good health. WALTER C. BURKET, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Behle, A. C.: General Septic Peritonitis and Its Treatment. *Northwest Med.*, 1922, xxi, 361.

The author quotes statistics to show that there has been a steady reduction in the mortality of general septic peritonitis.

In the treatment, ether may be used as a cleansing agent. Its beneficial results depend, not upon an antiseptic effect, but probably upon an irritating action which, according to Dubs, causes hyperæmia, increases peristalsis, and exerts a general tonic action.

Camphorated oil has been injected with the idea of preventing rapid absorption.

In Willis' opinion acidosis is not an important factor in peritonitis. He therefore opposes routine alkaline therapy.

Fromme and Friel believe that the first bacteria taken up by the lymph cause coagulation and block further passage of bacteria and lymph. Hence intestinal nourishment does not enter the blood vessels, and rapid exhaustion, dryness of the tongue, and great thirst result. These conditions are combated by the administration of fluid.

Bolton states that contractions of the diaphragm with concomitant changes in the abdominal and thoracic pressure favor the lymph flow. Therefore posture and drugs affecting respiration and the diaphragm are of importance.

Koch regards the omentum as an important bactericidal, exudate-forming, and absorbing agent. The exudate is protective and possesses bactericidal properties.

In gonococcic peritonitis associated with tubal infection operation is contra-indicated.

The author contrasts present-day treatment with that of twenty-seven years ago. Formerly a large incision, with often a third or fourth incision, was made when the surgeon sought for exudate, the bowels were turned out, exudate was wiped away with gauze, the gut was milked, an enterostomy was done or the bowel was punctured to evacuate the gas, and the abdomen was irrigated, sometimes permanent irrigation being established. These procedures took time and sapped the patient's vitality. Convalescence was prolonged and recovery seldom resulted.

The treatment given today consists in early eradication of the source of infection, a small incision, and gentle removal of pus and exudate, the gut being kept within the abdomen as much as possible. In cases operated upon early the abdomen is closed, whereas late cases and a walled-off abscess are drained. The operation is brief and the quantity of anæsthetic small. The patient is rested by sleep before and after the operation and rapidly regains strength. There is less after-treatment, the wound heals by primary intention, and the patient is up and about in seven to fourteen days. Cathartics are avoided when appendicitis is suspected.

The author makes the following summary:

When peritonitis is suspected give nothing by mouth and no cathartics; operate as early as possible to remove the source of infection; do no more than is necessary to eradicate the source of infection, and do not damage the peritoneum. In early cases do not remove the exudate (coarse foreign material due to perforation of the stomach or a large rent in the colon should be removed) and do not drain. Place the patient in Fowler's position. Overcome toxæmia by subcutaneous and rectal infusions of normal saline. Overcome dehydration by the rectal administration of tap water or 5 per cent glucose and 5 per cent sodium bicarbonate solutions. Apply heat over the abdomen by thermophore. Support the circulatory system by cardiac stimulation. If necessary, give morphine to quiet the patient and control peristalsis. WALTER C. BURKET, M.D.

GASTRO-INTESTINAL TRACT

Oliver, J. C.: Hypertrophic Stenosis of the Pylorus. *Ann. Surg.*, 1922, lxxvi, 444.

Congenital hypertrophic stenosis was first described in 1788. Perhaps the best of the earlier papers on this subject was that published by Hirschsprung in 1888.

The condition must be differentiated from stenosis due to carcinoma, cicatricial contraction following ulcer, hypertrophic gastritis, syphilis, and tuberculosis.

The case reported by the author was that of a man 51 years of age who first consulted him in 1919 because of symptoms of pyloric obstruction. The X-ray revealed pyloric obstruction and dilation of the stomach. Gastric lavage also showed marked gastric dilation and diminished acidity. On physical examination the patient was found to be cachectic. The abdomen was distended in its upper half and a small hard mass was palpable to the right of the midline at the level of the umbilicus. When the abdomen was tapped periodic waves moving from the left to the right could be seen distinctly. The condition was diagnosed as carcinoma.

At operation a smooth annular thickening about the consistency of cartilage was found at the pylorus. There was no involvement of the mesenteric glands and no nidus of cicatricial scars. The stomach was enormously dilated and the pyloric orifice tightly contracted. A typical Rammstedt operation was decided upon. A longitudinal incision made in the pylorus down to the mucosa relieved the stenosis immediately.

Following the operation the patient at once began to improve. To date he has gained 40 lbs. All gastric symptoms have disappeared. The treatment in this case differs from that employed in other cases re-

ported in that only a Rammstedt operation was performed while in the others a posterior gastro-enterostomy was done. I. E. Bishkow, M.D.

Graham, E. A.: Surgical Treatment of Syphilis of the Stomach. *Ann. Surg.*, 1922, lxxvi, 440.

It has been only recently that gastric syphilis has been recognized with any frequency, this being due largely to the Wassermann test and the development of gastric roentgenology. In the majority of instances, however, the diagnosis has been based on more or less indirect findings such as the association of suspicious lesions with a positive Wassermann reaction, marked deformities of the stomach shown by the X-ray but without the corresponding cachexia and anæmia of cancer, etc.

Graham has been unable to discover in the literature a case of gastric syphilis in which the spirochetes were demonstrated. He does not discuss the diagnosis but in this connection refers to articles by Mills and Eusterman. The surgical complications include all those incident to ordinary peptic ulcer and those due to scar formation in the healing process. The most common conditions are stenosis of the pylorus, hour-glass formation, and other conditions due to perigastric adhesions, etc. Perforation and hæmorrhage have also been recorded.

The literature reports thirty-two cases of gastric syphilis which have been operated upon. Gastro-enterostomy was done in seventeen cases and resection of the pylorus in four. The procedure in the rest is not stated. Because the data are incomplete or unsatisfactory, the results cannot be interpreted accurately. In general the cases were markedly benefited and there were only two deaths, one from nephritis and the other on the third day after operation. Equally good results were given by resection and by gastro-enterostomy.

The author reports three cases of apparently definite gastric syphilis which he has treated; two of them presented a type of lesion regarding which little is known. These are the cases in which there is moderate thickening of the entire stomach, which is reduced in size, and absence of pyloric stenosis and gross deformity, such as hour-glass formation and extensive perigastric adhesions. The symptoms consist of vomiting, pain, loss of weight, etc. Two cases had positive Wassermann reactions. In one case nothing was done, but in another a gastro-enterostomy was made with some relief. In the other case, with definite pyloric obstruction, a pylorectomy was done with entire relief of symptoms.

In those cases of generalized sclerosis of the stomach without organic stenosis of the pylorus or hour-glass formation, the benefit to be derived from surgery is doubtful. In the other cases, resection of the pylorus gave uniformly good results when stenosis was present, while gastro-enterostomy was frequently followed by only slight or temporary improvement. Graham concludes that, on the basis of present experience, pylorectomy is the better procedure. O. S. Proctor, M.D.

Scudder, C. L.: Gastric and Duodenal Ulcer. *Ann. Surg.*, 1922, lxxvi, 470.

This article is based on 310 cases of chronic ulcer of the stomach and duodenum treated by operation.

In the 171 cases of gastric ulcer the immediate mortality was 7.6 per cent.

The remote results in 108 cases are known. Ninety-nine of these patients are practically well, while nine report symptoms similar to those preceding treatment. The length of time since the operation in these cases is as follows: one year, nineteen cases; two years, twenty-five cases; three years, thirty-three cases; four years, ten cases; five years, eight cases; six years, three cases; seven years, seven cases; eleven years, one case; fourteen years, one case; and sixteen years, one case.

The operative procedures were: gastro-enterostomy, forty-seven cases; excision alone, six cases; excision and gastro-enterostomy, thirteen cases; cautery and gastro-enterostomy, fourteen cases; sleeve resection, three cases; gastrogastrostomy, one case; pyloroplasty, one case; division of adhesions, two cases; and partial gastrectomy, twenty-one cases.

In the 139 cases of duodenal ulcer the postoperative mortality was 6 per cent.

The remote results in ninety-four cases are known. Eighty-eight of the patients were well. The time elapsed since the operation ranged from eight to ten years.

The operative procedure used in the duodenal cases consisted in infolding of the ulcer, the application of omentum to the peritoneal surface of the ulcer, and a posterior gastro-enterostomy.

The general mortality for the entire group of 310 cases was 6.7 per cent. I. E. Bishkow, M.D.

Crile, G. W.: Gastric and Duodenal Ulcer and Cancer. *Ann. Surg.*, 1922, lxxvi, 467.

Of 761 cases of lesions of the stomach and duodenum treated at the Cleveland Clinic and on the Lakeside Surgical Service, data on 560 are available. These include 189 cases of carcinoma of the stomach, five cases of carcinoma of the duodenum, two cases of sarcoma of the stomach, 159 cases of ulcer of the stomach, 200 cases of ulcer of the duodenum, and five cases of tumors of the stomach (undifferentiated).

In the early cases of this series the mortality was high, but with improved technique and management, especially pre-operative care, the mortality in the last 108 cases of gastro-enterostomy and resection was 2.8 per cent. In simple gastro-enterostomy the mortality was less than 1 per cent.

Of the 560 cases, 450 came to operation. The operations were as follows: eighty-one two-stage and temporizing operations, 302 gastro-enterostomies, and forty-eight resections of the stomach. Information has been obtained regarding 325 patients as follows:

PATIENTS LIVING AFTER OPERATION FOR DUODENAL AND GASTRIC CANCER AND ULCER

Condition	Under one year	One to two years	Two to three years	Three to five years	Over five years	Total
Carcinoma of stomach	11	11	1		6 including 1 for 10 years 1 for 13 years 1 for 16 years 2 for 20 years 1 for 30 years	35
Carcinoma of duodenum		1		1		2
Ulcer of stomach	17	19	2	5	17 10 for from 5 to 10 years 7 for from 10 to 15 years	59
Ulcer of duodenum	62	27		2	27 23 for from 5 to 10 years 4 for from 10 to 12 years	118
		(Length of life undesignated			1)	

PATIENTS DYING AFTER LEAVING HOSPITAL

Carcinoma of the stomach—33 deaths

Less than 1 year	23	(including 11 inoperable cases)
1–2 years	1	
3–5 years	2	
Not known	7	(including 3 inoperable cases)

Ulcer of the stomach—6 deaths

Less than 1 year	2	
3–5 years	1	
Not known	3	(including 1 inoperable case)

Ulcer of the duodenum—10 deaths.

Less than 1 year	1	
More than 5 years	2	
Not known	7	(including 2 inoperable cases)

To a questionnaire sent to all patients operated upon more than one year ago, sixty-six replies were received. Eighty-two per cent reported that their symptoms were relieved, 85 per cent stated that they were able to resume their normal work in less than six months after the operation, 65 per cent have required no care for "stomach trouble" since their operation, 22 received some postoperative treatment, 2 reported subsequent operative treatment, 31 had gained in weight from 5 to 62 lbs., and 7 had had a definite loss in weight.

The study led to the following conclusions:

1. The operative mortality is now reasonably low.

2. The body as a whole, the presence of focal infection or auto-intoxication, and the patient's work, habits of eating, and food should be considered as well as the local ulcer.

3. The results of treatment are better in cases of duodenal ulcer than in cases of gastric ulcer.

4. Vicious circle is no longer seen.

5. The development of peptic ulcer is dependent upon the curative effect of the treatment. It is a part of the disease rather than a result of the operation.

6. In general, the Sippy treatment should be tried first in the acute cases. If this does not give definite improvement in two weeks, operation should not be further delayed.

I. E. Bishkow, M.D.

Perman, E.: Investigations on the Histology and Healing of Gastric and Duodenal Ulcer (Untersuchungen ueber die Histologie und die Heilungsverhaeltnisse des Magen- und Duodenalgeschwures), *Acta chirurg. Scand.*, 1922, lv, 285.

In a very recently published work on the histology of gastric ulcer Askanazy contradicts the theory advanced by Rokitansky and Hauser that the healing of the ulcer is due to shrinkage of the surrounding newly formed connective tissue which causes the edges of the mucosa to approach each other and finally to coalesce. Askanazy distinguishes four layers in the structure of the tissues around the ulcer: (1) the exudate, (2) necrosis, (3) the granulation tissue, and (4) the cicatricial layer. He believes that in the process of healing the granulation layer is of chief importance. Nissen and Nicolaysen confirm this view. Askanazy and Nicolaysen also found the changes in the nerves surrounding the ulcer which had been described previously by Perman, namely, division of the nerves by the ulceration and perineuritic and neuritic changes.

Perman's material consisted of resected specimens and excised ulcers. Autopsy material is valueless. The Van Gieson stain is especially well suited for the demonstration of connective tissue. Not every ulcer shows all of the four layers.

The innermost layer (exudate) appears as a structureless zone filled chiefly with cell nuclei from leucocytes and formed by shed necrotic tissue, transformed fibrin, migrated cells, gastric epithelium, and gastric contents.

The necrotic layer consists of necrotic unshed tissue; when there is necrosis of the fibrillary connective tissue, intact, red-stained connective-tissue trabeculæ are visible.

The granulation layer consists of loose granulation tissue formed by young fibroblasts and contains wide, newly-formed capillaries which usually run straight and toward the ulcer; there is also an abundant infiltration of inflammatory cells, mostly lymphocytes, but also some leucocytes. This layer may have a level border or may show granulations penetrating into the ulcer. The surface of the granulation layer may be necrotic or normal and covered only by a layer of exudate. In the latter case the layer of necrosis is entirely absent, but it may have

separated and fallen off during or after the operation. Only a few cases showed the entire base of the ulcer covered by the granulation layer, the layer may be partly or completely absent.

In the outward direction the granulation layer undergoes transition into the cicatricial layer which usually consists of dense, fibrillary connective tissue. This is the largest ulcer layer and forms the true ulcer tumor or induration. If the granulation tissue covers the base of the ulcer, the cicatricial zone is permeated by delicate vessels. The cicatricial zone often shows an accumulation of phagocytes, usually lymphocytes and plasma cells. As a rule the leucocytes are few in number.

There are two main types of ulcers, viz., those with and those without the typical granulation tissue. Of twenty-three gastric ulcers, thirteen belonged to the first group and ten to the second.

The healing of an ulcer proceeds as follows:

Young, multicellular connective tissue first forms around the acutely developed lesion, the deeper parts of which are transformed, when the ulcer heals, into fibrillary connective tissue. The portion toward the ulcer is changed into a granulation layer; in older ulcers which are surrounded by older fibrillary connective tissue a granulation layer forms on the inner side of this connective tissue and then grows into the ulcer cavity, whereas the newly-formed fibrillary connective tissue of the granulation layer is transformed into the cicatricial layer. In this way a large concentric filling of the ulcer results and is seen roentgenologically during the course of internal treatment (Oehnell). According to the microscopic picture, the greatest tendency toward healing is at the periphery of the ulcer. With the filling-in of the defect and following it, the newly-formed connective tissue of the base of the ulcer is covered by the epithelium growing out from the edges of the mucosa. This occurs only if the granulation tissue covering the base of the ulcer is normal at least at the periphery, as epithelium cannot grow over necrotic tissue. The absence of thickening of the gastric wall at the site of the scar after the healing of the ulcer is explained by the gradual disappearance of the excess connective tissue.

The most important factor in the healing of gastric ulcer is the new formation of connective tissue by the granulation layer in the base of the ulcer. It is hardly imaginable that a thick deposit of dense fibrillary connective tissue surrounding an ulcer should shrink any further or that a callous gastric ulcer becomes obliterated merely by shrinkage of the surrounding connective tissue. The possibility that such an ulcer may become healed cannot be denied, however, as it is not unusual to see a patient with an ulcer found penetrating at the time of operation become entirely free from symptoms after gastro-enterostomy and remain well for a long time.

The differentiation of the two main types of ulcer with the microscope is of clinical interest. The presence of granulation tissue shows a tendency to healing. In cases in which the entire ulcer surface or a large part of it is covered by granulation tissue the tendency to heal is good, and when the granulation is missing the tendency to heal is poor. A wide necrotic layer shows that the ulceration is in the process of rapid progression.

The comparison between the histologic picture and the history of the case, particularly with regard to the duration and periodicity of the disease, is of great importance. No conclusions can be drawn as to the duration of the clinical symptoms from the size of the ulcer crater and the tumor ulcer. Granulation tissue is seen in the base of the ulcer whether its duration has been long or short. In three cases reported the ulcer tumor consisted chiefly of young, newly-formed connective tissue and therefore had probably been formed during the last exacerbation. The presence of old connective tissue in the lateral portions of the tumor makes it very probable that the ulcer found at operation originated in the base of an older and more or less healed ulcer. The histories were of several years' duration, but the ulcers developed during a relatively short period of time. These three cases, and the fact that not rarely abundant granulation tissue is found in the ulcer in spite of the expected unfavorable histologic picture furnish a pathologico-anatomical basis for the view that in a number of cases the ulcer heals more or less completely during the symptomless interval and that a new ulcer is responsible for the new symptoms.

The duodenal ulcer behaves similarly to the gastric ulcer. In three of five cases granulation tissue was completely absent; in the two other cases it was present in a few areas, but only in small amounts. Both gastric and duodenal ulcers were found in eight cases. These are characterized by acute inflammatory changes: viz., œdema, the infiltration of leucocytes, and the new formation of connective tissue. As a rule they show a broad necrotic layer.

None of the perforating ulcers showed granulation tissue of the same type as that found in non-perforating ulcers. Usually these were surrounded by a marked leucocytic infiltration. The distant tissues also showed large numbers of leucocytes, especially in and around the blood vessels. The connective-tissue formation is most abundant in the subserosa where often a marked deposit of newly-formed œdematous tissue consisting of young fibroblasts is seen. A frequent finding is œdema and fragility of the tissue around the ulcer.

The severity of the acute inflammatory changes has no definite relationship to the time which elapsed between the perforation and the operation. The acute inflammatory changes are not the result of peritonitis due to perforation, but are caused by the ulcerating process and show that this was undergoing a relatively rapid progression when the perforation occurred. The tissues around a perforated ulcer may show either acute changes alone or both acute and chronic changes. The histologic picture is exceedingly variable, depending upon the conditions under which the ulcer perforates. It differentiates the presence of the frequently severe, acute inflam-

matory changes from the picture usually seen in non-perforating ulcers. With perforation there is often a new, acutely developed ulcer or relatively rapid progression of the ulcerating process in a previously existing unhealed ulcer. A tendency of the ulcer to recur is also seen, and frequently a recurrence at the site of an old scar is demonstrable.

L. Neuwelt, M.D.

Van Hook, W.: The Problems and the Progress of Gastric Ulcer Surgery. *Med. Press*, 1922, n.s. cxv, 362.

In Paterson's opinion the important factor in ulcer healing after gastro-enterostomy is the discharge of alkaline juices into the stomach. He states that pyloric occlusion is unnecessary with gastro-jejunostomy and that gastro-enterostomy, if a physiological operation, is as effective treatment for ulcers of the body of the stomach as for pyloric ulcers.

Bruett of the Hamburg Clinic states that both remote and immediate operative results should be taken into account when the indications for and the method of operation are considered, and that a callous ulcer at a distance from the pylorus, even when it does not penetrate, should be treated by transverse resection, a procedure which produces more normal gastric relations. The mortality of transverse resection is nearly the same as that of gastro-enterostomy but the late results are better. Billroth's second method should be used only when transverse resection is impossible and there is a considerable difference in the width of the gastric stumps.

In cases of ulcer near the pylorus and cases of cicatricial pyloric stenosis gastro-enterostomy may be employed and occasionally may be combined with pyloric closure.

Opposition to transverse resection is based chiefly on its mortality. Von Haberer, however, has reported 100 gastric resections by the first Billroth method in which there were no deaths and satisfactory functional results were obtained. He believes that this procedure more closelys meets the physiological requirements than other operations. Thus far there has been no recurrence of ulcer in his cases.

Gastro-enterostomy seems to cure a large number of cases. Kocher believes that a correctly placed and a properly functioning gastro-enterostomy is permanent and that in the majority of cases the ulcer heals and the formation of new ulcers is prevented. Wilensky and Crohn advise against gastro-enterostomy in the absence of pyloric stenosis.

The Mayo Clinic employs local excision of the ulcer or cauterization of its base.

Von Eiselsberg states that gastro-enterostomy is especially satisfactory in cases of pyloric obstruction. He calls attention, however, to the relative frequency of peptic ulcer of the jejunum after gastro-enterostomy in cases presenting insufficient objective findings. Von Eiselsberg's pyloric exclusion combined with gastro-enterostomy promptly corrects the ulcer hæmorrhages but is followed more frequently by recurrence than simple gastro-enterostomy. After transverse resection of the stomach for ulcer in sixty-four of von Eiselsberg's cases there was a recurrence of the ulcer in nine, and in four of these a second operation was necessary. Von Eiselsberg confirms von Haberer's statement that Billroth's first method gives successful results and has a low mortality.

To reduce the acid-forming area of the stomach various methods have been employed, such as extensive resection of this portion, pylorectomy, reefing or in-folding of the wall, and section of the gastric wall down to the mucosa around the ulcer-bearing area to decrease the activity of the glands.

Roux and Métraux emphasize the gravity of extensive pylorogastrectomy as compared with simple gastro-enterostomy.

The author does not favor the Heinecke-Mickulicz method or the Finney pyloroplasty for gastric ulcer.

The Germans attribute especial importance to the changes in the nerve and blood supply caused by resection of the outlet of the stomach.

The author states that gastro-enterostomy favors healing by improving the gastric conditions but has no direct curative effect. Therefore after this operation the patient must be kept under observation.

His conclusions are summarized as follows:

1. Intelligent patients should be told that secondary operations are sometimes necessary to give the best chances for recovery by the least radical methods.

2. Gastro-enterostomy is applicable to cases of ulcer near the pylorus with symptoms of obstruction if the patient is well cared for afterward.

3. Partial pylorogastrectomy by the first Billroth method has a place in the treatment of callous ulcers, ulcers remote from the pylorus, multiple ulcers, and cases complicated by perforation and the penetration of adjacent organs.

4. Gastro-enterostomy is suitable also for other types of ulcers. In such cases, however, failure to secure full relief may necessitate a subsequent radical operation such as a Billroth I resection.

5. Conservative methods may be better for both the patient and the surgeon.

Walter C. Burket, M.D.

Woolsey, G.: Choice of Operation for Gastric Ulcer. *Ann. Surg.*, 1922, lxxvi, 476.

This article is based on a series of fifty-seven consecutive cases of gastric ulcer operated upon by the author. Cases of acute or chronic perforation are not included. The operations performed were of five types, viz.: gastro-enterostomy, excision, mesogastric resection, resection by the Billroth II method, and resection by the Pólya method.

Simple gastrojejunostomy was done in nineteen cases, with good results in 80 per cent.

In some cases the pylorus was excluded but the results were no better than when this was not done. Therefore it was discontinued.

In eight cases in which the ulcer was resected good results were obtained in 80 per cent. In most in-

stances a gastro-enterostomy also was performed. When the ulcer is not too far from the pylorus the author favors resection.

In nine cases a resection was done. As these were the worst types of gastric ulcer, the results were not so satisfactory. Thirty-three per cent of the patients are well and thirty-three per cent are better.

Eight cases were treated by the Billroth II operation. There were four deaths.

The Pólya resection was performed in thirteen cases, with good results in 91.6 per cent.

For ulcers 3 to 4 in. from the pylorus the choice lies between resection and excision.

For ulcers near the pylorus or 3 in. from the pylorus the author favors the Pólya method.

If the operation is done in two stages or a gastro-enterostomy has been done previously, the Billroth II method is the rational procedure.

For ulcers at or close to the pylorus, especially those which cause stenosis, a posterior gastro-enterostomy is the simplest and safest operation.

Because of the possibility of cancerous degeneration of a gastric ulcer, resection or excision of the lesion is ideal unless the operative risk is greatly increased by the general or local condition.

I. E. Bishkow, M.D.

Stenglein, M.: The Treatment of Callous Gastric Ulcer by Transventricular Excision by the Kraske Method (Behandlung des callosen Magengeschwuers durch transstomachale Excision nach Kraske. *Beitr. z. klin. Chir.*, 1922, cxxvi, 400.

As the etiology of gastric ulcer has not yet been determined and as there are so many contradictory views regarding it, the surgical treatment must depend upon the indications in the individual case. The operation should always be as conservative as possible and as radical as necessary, and particular care must be taken to avoid injuring the important vessels and nerves of the lesser curvature.

The author reports a series of cases in which an ulcer on the posterior wall and the lesser curvature of the stomach was exposed through an opening in the anterior wall of the stomach according to the Kraske method and removed without opening of the posterior wall. Following the excision of the ulcer the wound was cauterized and the musculature and mucous membrane were joined with deep sutures. Gastro-enterostomy was performed only when it appeared that the ulcer had a mechanical effect on the pylorus by reason of its situation. In recent cases entrance has been gained to the stomach through the posterior wall after division of the gastrocolic ligament.

The application of clamps to the stomach does not appear to be essential for asepsis. By proper lavage of the stomach before operation, by the aspiration of escaping gastric juice with an air-pump during the operation, and by careful packing of the vicinity the escape of gastric contents into the abdominal cavity can be prevented. In Stenglein's opinion the application of intestinal clamps may be a causative factor in the development of peptic jejunal ulcer. In his own cases in which clamps have not been used there has been no instance of peptic jejunal ulcer in the last ten years.

In the fourteen cases of this type which were operated upon (only those with perforated ulcers of the posterior wall and lesser curvature) there were two deaths following operation, one on the nineteenth day from embolism, and the other on the fourth day from pleurisy consequent on the anæsthesia. The latter was that of a patient who was 67 years old. Among the other twelve cases there were six complete cures, five recurrences, and one case in which an ulcer could not be discovered although the patient constantly complained of symptoms. In the cured cases gastro-enterostomy was performed in two, gastrostomy in one, gastroplasty in two, and excision of the ulcer only without any other operation in one. In all of the cases of recurrence excision of the ulcer alone was done; in one of these cases a gastro-enterostomy performed later gave permanent relief from pain.

It appears therefore that the results of transventricular excision of the ulcer according to the Kraske or Meisel method are better when this operation is combined with gastro-enterostomy. On the basis of his own experience the author can recommend transventricular excision as an emergency operation but not as the method of choice for ulcers of the posterior wall. He believes that the most important cause of recurrence is the entirely inadequate loosening and mobilization of the posterior wall and, above all the continuance of the circulatory disturbance which is increased by the suture.

Bode (Z)

Peterson, E. W.: Acute Intestinal Obstruction in Infancy and Childhood; a Brief Review of Fifty-Five Cases. *Surg., Gynec. & Obst.*, 1922, xxxv, 436.

Peterson reviews fifty-five cases of intestinal obstruction in fifty-three young subjects. Cases of imperforate anus, congenital atresia or stenosis, and strangulated external hernia have not been included.

Acute intestinal obstruction is the most serious surgical affection of the abdomen in early life. Most other surgical conditions tend toward spontaneous recovery. It is generally accepted that the lumen of the obstructed bowel contains a toxin which, when injected intravenously into a normal animal, causes the symptoms of intestinal obstruction, and that certain chemicals are developed as the result of protein disintegration which cause the symptoms present in acute intestinal obstruction, namely the fall in blood pressure, temperature disturbances, vomiting, diarrhœa, derangement of kidney function, high non-protein blood nitrogen, profound congestion of the duodenal and jejunal mucosa, and collapse which sometimes result in death.

In the fifty-five cases the obstruction developed in infants in forty-three, and in children (from

twenty months to 11 years) in twelve. There were twice as many males as females. Intussusception was the responsible factor in forty-six cases. In the others the condition was due to early postoperative band or adhesion obstruction, late postoperative band or adhesion obstruction, band or adhesion obstruction without previous operation, tumor obstruction, mesenteric thrombosis, pressure obstruction, or foreign body obstruction.

Intussusception is pre-eminently an affection of infancy and early life. Thirty-nine of the patients whose cases are reviewed were infants from six days to thirteen months old and seven were children from twenty months to 8 years of age. Thirty were males and fourteen were females. The cardinal symptoms are pain, shock, vomiting, mucohæmorrhagic stools, and abdominal tumor. The pathologic process consists in invagination, circulatory stasis with exudation and œdema, infection, inflammation, and gangrene of the intussusceptum. Ileocolitis, uncomplicated abdominal purpura, and spastic colitis must be ruled out.

Pain was present in all cases and some degree of shock in most of them. Vomiting occurred in every case. When vomiting occurs early it is indicative of circulatory strangulation. Mucohæmorrhagic stools and a palpable tumor were both present in 95 per cent of the cases. Early operation is the safest, simplest, and only certain plan of treatment, and gives almost uniformly good results in all types of cases regardless of the age of the patient. According to the classification of Clubbe, the varieties were: enteric, three; ileocæcal, thirty-one; enterocolic or double intussusception, eight; and colic, two.

In the majority of cases no definite causative factor was found. In two cases the responsible factor was a Meckel diverticulum; in another, a congenital tumor of the cæcum; and in several instances appendicitis. The author has made it a rule always to remove the appendix, believing that occasionally appendicular irritation induces the spasm and brings about the invagination.

There was recurrence in two cases. In one, the intussusception returned at the same site. In the other, adhesions necessitated a second operation, and still later another intussusception required reduction.

There was but one successful reduction without laparotomy. When reduction was accomplished, the mortality was 21.5 per cent. Excluding the deaths not due directly to the intestinal obstruction or its surgical treatment, the mortality drops to 10.7 per cent. The longest interval between the onset of the condition and successful reduction was four days, and the shortest, five hours. All patients seen within forty-eight hours of the onset recovered. In the cases requiring resection the mortality was 72.4 per cent. Recovery in a case developing an infarct after resection is rare.

The most important factor in the treatment of intestinal obstruction is early operation. Finney says it is more important to perform the operation early than well. A two-stage operation will often prove successful when a single procedure may result in failure. A local anæsthetic is the anæsthetic of choice in many cases.

O. S. Preston, M.D.

O'Conor, J.: Acute Intestinal Obstruction. *Brit. M. J.* 1922, ii, 398.

The general symptoms in intestinal obstruction are frequently delusive as regards the amount of systemic poisoning and shock which has taken place. Early operation without eventration, undue manipulation, or prolonged anæsthesia offers the best chances of recovery.

The location of the incision is extremely important. The author has found that when the area of involvement is not indicated by the history, the obstruction will usually be found in the ileocæcal region. In such case the incision is made along the lower portion of the right semilunar line. As a rule such an incision obviates too much handling of the bowel.

When a complete circle of bowel is gangrenous a lateral anastomosis is done, the gangrenous bowel is incised, and the intestinal contents are emptied into a pus basin. A catgut ligature is then tied around each portion of bowel, the gangrenous portion is cut away, the stumps are inverted, and the catgut purse-string sutures are tied.

When a narrow band of gangrene has resulted from obstruction, stay sutures are inserted over the gangrenous band, the bowel is cut through and evacuated, and a continuous Lembert suture is placed about the incised bowel.

In doubtful cases in which the band of gangrene is wide a crucial incision is made in the gangrenous area, the intestinal contents are evacuated, the four gangrenous flaps are excised, and the interior of the bowel is inspected. If there is no angulation the bowel is reunited by a continuous Lembert suture.

In acute colic obstruction the outlook is very grave because of the enormous distention.

Through a right vertical incision the hand sweeps down to the right iliac fossa and at the lower portion of the sacculation of the cæcum a small incision is made in the abdominal wall. The cæcum is then pulled through this opening and through-and-through sutures previously introduced at the vertical incision are tied. The cæcum is sewed to the incision, incised, and evacuated. The later operation is then performed according to indications.

In conclusion the author states that if greater care was taken in the peritonization of the stumps and raw surfaces at operation, the number of cases of intestinal obstruction would be greatly decreased.

I. E. Bisuxow, M.D.

Smith, R.: Intestinal Foci of Infection. *Ann. Surg.*, 1922, lxxvi, 515.

The author believes that chronic arthritis originates from a focal infection in the intestinal tract due to the failure of some part of the ileocæcal coil to empty itself properly.

X-ray examination of over 100 cases of chronic arthritis has shown a uniform picture of a congenital mobile cæcum. By a reduplication of peritoneum from the right colic artery to the parietal peritoneum over the right kidney, the colon is rotated and folded so that an hour-glass appearance is produced, with a thin-walled, toneless cæcum which does not empty itself. This inert sac ultimately becomes a culture medium for various bacteria, chiefly streptococci.

Stool examination in thirty cases has shown amœbæ and flagellate protozoa. Perhaps these organisms play a secondary rôle in the infection by furnishing culture media for bacterial growth, and by their passage through the mucous membrane make a portal of entrance. Ely found amœba histolytica in the head of the femur removed in a case of arthritis deformans.

In 1915 the author reported fourteen cases of chronic arthritis operated upon for the removal of intestinal foci of infection. Two of the patients have died, four are untraced, three are no better, one has an arrest of the disease but is unable to walk on account of joint fixation, and four are restored to normal activity.

Of the patients whose cases are reported in this article, thirty were operated upon before 1917. Ten who were bedridden and helpless when operated upon are now able to work with their hands and are self-supporting. In these cases a partial colectomy or ileosigmoidostomy was done.

In thirty-eight cases operated upon since June, 1920, there were eight Mayo colectomies on the right side, two ileosigmoidostomies, and twenty-eight plastic operations on the ileocæcal coil designed to restore cæcal function and do away with the sac. There was temporary alleviation of the symptoms of pain, swelling, and joint immobility. Following the use of restricted diet, liquid paraffin, and abdominal support, there was progressive improvement. The joints became amenable to orthopedic treatment as soon as the pain subsided. Operations and manipulations may be carried out without fear of lighting up another attack of acute inflammation.

The most striking immediate results follow removal of the right colon together with daily hypodermoclysis of 1,000 c.cm. of saline solution until the quantity of urine increases from 1 to 2 liters, which occurs about the tenth day. In forty-eight to seventy-two hours the swelling and pain disappear and the joints become movable. When the quantity of urine reaches normal, the joint symptoms recur.

After the release of constricting bands or the division of a Lane kink, recurrence may be prevented by the interposition of tissue or the use of free omental grafts to cover all the denuded surfaces.

The author concludes that chronic polyarthritis may be the result of a focal infection in the ileocæcal coil and that a case of arthritis calls for careful investigation of the gastro-intestinal tract, especially the mobility and motility of the ileocæcal coil. If a pocket is found the treatment should consist in an abdominal operation to correct the faulty mechanical conditions and to restore the function of the cæcum, a prolonged medical régime to restore the normal intestinal flora, and orthopedic procedures to restore joint function.

WALTER C. BURKET, M.D

Hildenhagen, M. A.: Two Cases of Rare Diseases of the Rectum (Zwei Fælle seltener Erkrankungen des Mastdarms). *Westnik Chir. i pogran. oblastei*, 1922, i, 65.

Case 1 was that of a woman 46 years old who had a palpable, hard, and very painful infiltration with an ulcerous base in the ampulla of the rectum. The Wassermann reaction was negative. Carcinoma of the rectum was suspected and an artificial anus was formed. The operation was followed by regression of the infiltration and its complete disappearance in a few weeks after a course of anti-syphilis treatment. This was therefore a case of gumma of the ampulla of the rectum.

Case 2 was that of an unmarried woman 50 years old who had been castrated and subjected to prophylactic radium treatment per rectum because of a carcinomatous cystoma of the ovary. A hard, deeply penetrating ulcer of the rectum developed which clinically resembled a carcinoma but on biopsy was recognized as an inflammatory radium ulcer.

PETROW (Z).

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Drennan, J. G.: Bacteriology of the Gall-Bladder. *Ann. Surg.*, 1922, lxxvi, 482.

This study is based on 100 unselected gall-bladders removed at the Mayo Clinic. Cultures were made of the fluid contents, which consisted largely of mucus, serum, blood, and degenerated epithelial and pus cells and in no way resembled pure bile. Infected fluids were found in only 19 per cent of the cases. The organism was the bacillus coli in 12 per cent, the staphylococcus aureus in 4 per cent, the streptococcus hæmolyticus in 2 per cent, and a non-pigment-forming sarcina in 1 per cent. The possibility of obtaining cultures from gall-bladder fluids is dependent upon the amount of inflammatory exudation acting as a diluent.

From the experiments reported it seems permissible to assume that the growth of bacteria will not take place in pure bile. To demonstrate this, a series of tests was made with various dilutions of bile inoculated with different types of bacteria. Eighteen organisms were inoculated into 10, 70, 80, 90, and 100 per cent glucose bouillon, and controls in 1 per cent glucose bouillon were made. These organisms, with the exception of the non pigment-forming sarcina, grew well in the control, and in 10 per cent and 70 per cent ox gall. In 80 per cent ox gall only 33 per cent of the organisms showed growth, and in 90 per cent ox gall, only 5.5 per cent. In the pure ox gall there was no growth.

Gatewood and Poppens, P. H.: Cholecystenterostomy from an Experimental Standpoint. *Surg., Gynec. & Obst.*, 1922, xxxv, 443

Nussbaum is believed to have been the first to suggest the operation of cholecystenterostomy. Van Winiwarter first performed an operation of this type in 1880, sewing the gall-bladder and ascending colon together and fastening them in the abdominal wound. Subsequently many surgeons took up the procedure experimentally and clinically, among them Gaston, Harley, Golsi and Murphy, the latter advocating use of his button. The operation was first done on man in one stage by Monastyrski in 1887. Later it was done by Kappeler, Mayo-Robson, and others.

Though it is now a recognized operation with fairly definite indications, there is still a difference of opinion as to what part of the gastro-intestinal canal should be used. Most surgeons prefer the duodenum if it is accessible. When necessary, the stomach, jejunum, ileum, or colon may be used. It is best to avoid the latter, however, on account of the danger of suppurative cholangeitis. At the present time cholecystogastrostomy is gaining in favor. It is associated with less danger of infection, its field is more accessible, it does not cause much if any gastric disturbance, and in dogs with fistulæ it has never been followed by any impairment of the digestive processes or the general health. A number of surgeons have advocated the jejunum because of its accessibility.

The likelihood of an ascending infection of the bile passages and liver is of far greater importance than any digestive disturbance. The ampulla of Vater is an effective barrier to all foreign bodies, such as bacteria-laden food particles. The number of bacteria increases from the duodenum to the sigmoid. In experiments, nearly all cholecystenterostomies have led to liver infection. While many clinical cases seem to have escaped this complication, it is a question whether the patients lived long enough for its development or whether the fistulous openings closed after subsidence of the obstructive pathologic condition.

The authors conducted experiments in an endeavor to find out the method least apt to be followed by an ascending infection of the bile passages and liver. These experiments consisted in making forty-two anastomoses in dogs. Cultures were made from the gall-bladder, the liver, and the portions of the gastro-intestinal tract used for anastomosis. Grossly, all livers appeared normal at the time of operation, and in a number of instances sections taken were entirely negative. The common duct was doubly ligated and cut.

The cultures of the gall-bladder prior to operation, both aerobic and anaerobic, were sterile. After operation, in every instance, whether the animal lived one day or three hundred days, and regardless of the viscus employed for the anastomosis, the gall-bladder was infected. In the older cases, the gall-bladder became narrow and the stump of the common duct which was dilated in the earlier cases atrophied so that a probe could scarcely be passed down it. No evidence of ulcer formation was seen at the line of anastomosis. Microscopically, the mucosa of the gall-bladder was inflamed and thickened. The findings in the liver varied considerably, depending greatly upon the amount of cholangeitis. Although a round-cell infiltration was frequently discovered in the interlobular septa, a definite abscess formation was found only in two dogs. The gall-bladders contained many and varied micro-organisms, chiefly the colon bacillus, the staphylococcus, and anaerobes.

From the experiments performed on dogs in which the gall-bladder was anastomosed to the stomach, duodenum, and colon, the following conclusions are drawn:

The gall-bladder invariably becomes infected, whatever viscus is used for anastomosis, and there is little, if any, difference between the stomach and the duodenum in the matter of rapidity of infection. The colon is not the portion of the gastro-intestinal tract to be chosen by preference. Its use is associated with much greater immediate danger of peritonitis and early liver infection than the use of the upper part of the gut. The liver becomes infected sooner or later in the method employed by Gatewood and Poppens. From an experimental standpoint, cholecystenterostomy is an operation to be recommended only for well-selected cases, such as carcinoma of the pancreas in which the temporary comfort of the patient is paramount, and cases of irremovable common-duct obstruction.

O. S. Pheiffer, M.D.

Drennen, E.: Traumatic Pancreatitis. *Ann. Surg.*, 1922, lxxvi, 488

The author reports a case of traumatic pancreatic cyst in a boy aged 4 years whose abdomen had been injured by a wagon wheel. The child was somewhat shocked and complained of pain in the upper abdomen. When he was admitted to the hospital, two weeks later, there was a suggestion of fullness and slight tenderness in the epigastrium. The temperature and pulse were normal. The white cell count was 13,000. The parents refused to allow an operation and took the child home. Six and one-half months after the injury the patient was returned to the hospital with a globular epigastric swelling about the size of an orange. This was tense, somewhat tender, and almost completely fixed in position. X-ray examination showed a spherical cloudiness in the upper abdomen. The temperature, pulse, and respiration were normal.

At operation through a midline incision the omentum presented numerous yellowish-white spots of fat necrosis. A large globular cyst lying behind the stomach in the lesser sac was immediately revealed. By tearing through the mesocolon, the cyst was fully exposed. It was then packed off and drained of 3 pts. of fluid by means of a trocar and cannula. At the deepest part of the cyst a small

elliptical opening about the size of the tip of the little finger communicated with the body of the pancreas at a point just to the left of the median plane. The edges of the cyst where the trocar had entered were marsupialized to the anterior abdominal wall and a large tube drain was inserted deeply into the cyst cavity. The cyst fluid contained pancreatic ferments. The omental tissue showed fat necrosis.

Convalescence was uninterrupted. Drainage was never profuse and rapidly grew less. The cyst cavity was irrigated daily with 1:10,000 silver nitrate solution. Seventeen days after the operation the patient left the hospital with the wound healed.

Of forty-six patients whose cases were collected by Stuart, thirty-nine were operated upon, twelve died, and twenty-seven recovered. After an exploratory laparotomy Ochsner successfully drained an abscess of the pancreas and Delatour successfully drained a pancreatic cyst from behind.

The author is undecided as to whether posterior drainage should be employed without previous anterior exploratory laparotomy. Posterior drainage is best in the treatment of pancreatic abscess.

Anterior marsupialization has given such satisfactory results in the majority of cases that it is the operation of choice. Complete excision of the cyst will generally be found impractical or impossible.

WALTER C. BURKET, M.D.

Souther, C. T.: Case Report: A Large Pancreatic Cyst. *Cincinnati J. M.*, 1922, iii, 285.

The author's case was that of a girl aged 16 years. Four years ago the abdomen began to enlarge gradually. Three years ago 6 qts. of fluid were removed from the abdomen by tapping. Two years ago 8 qts. were withdrawn. Gradual refilling occurred. Otherwise the patient seemed well. The temperature, respiration, and pulse were normal. The abdomen was enlarged from the symphysis pubis to the diaphragm. Percussion dullness extended from the pelvis to the stomach in the midline. The abdomen was tympanitic over both flanks and the stomach.

Operation performed through a midline incision below the umbilicus showed the abdomen to be filled by a large cyst whose base was attached in the upper part. The cyst wall was slightly yellow. Ten quarts of gray, milky fluid were drawn off by means of a trocar and suction apparatus and the sac was then drawn out and opened more widely. The lining of the cyst was rubbed with an iodine sponge and part of the cyst wall was excised. The sac, with a rubber tube tied into it, was then drawn out through a small incision above the umbilicus and fastened and the abdomen closed.

There was almost no drainage. The patient left the hospital on the sixteenth day and convalesced well until the twentieth day when she developed an influenza-pneumonia from which she is now recovering.

The cyst presented below the transverse colon. Pancreatic cysts may present above the stomach, between the stomach and colon, or below the colon.

WALTER C. BURKET, M.D.

MISCELLANEOUS

Clute, H. M.: Subphrenic Abscess. *Boston M. & S. J.*, 1922, clxxxvii, 681.

Subphrenic abscess is usually secondary to perforation of a gastric or duodenal ulcer or to appendicitis. Less common causes are disease of the gallbladder, biliary tract, pancreas, spleen, or liver; empyema; wounds of the abdomen and chest; soiling of the abdominal cavity at operation; and septicæmia with localization of the infection between the diaphragm and the liver.

In addition to the posterior "uncovered area," there are four fairly distinct peritoneum-lined spaces between the liver and the diaphragm which are formed by peritoneal reflexions. The coronary and left lateral ligaments divide the diaphragmatic surface of the liver roughly into an anterior and a posterior half, and the falciform ligament divides its anterior and superior peritoneal surfaces into a right and a left half. The left intraperitoneal space is the lesser peritoneal cavity.

A perforated gastric ulcer tends to drain into the right anterior space. A posterior gastric ulcer may perforate into the left posterior space. A high appendiceal abscess may drain into the right posterior space by way of the lateral colic groove. Infection readily follows the lymphatics behind the cæcum and the ascending colon into the subphrenic area. A pylephlebitis may present as one of its features an abscess about the portal vein just below the diaphragm. This abscess may contain pus alone or pus and gas. The gas comes from a viscus or is produced by anaerobic bacteria.

The symptoms may begin insiduously or acutely. When the onset is gradual, the patient may be convalescing seemingly well from a surgical lesion in the abdomen when a steadily rising daily fever with chills, sweats, and loss of appetite and weight develops. There is a sense of fullness in the epigastric region associated with considerable gastric distress, belching of gas and sour eructations, hiccough, cough, and pain on deep breathing (a diaphragmatic pleurisy). The patient looks and feels very sick and soon grows worse rapidly.

An acute onset may occur with shock and collapse from a gastric or duodenal perforation. A diffuse peritonitis or a localized subphrenic abscess may result.

Physical examination shows marked limitation of motion on the affected side of the chest, a visible widening or bulging of the right lower thorax, and occasionally œdema over the right side or the back of the chest. Percussion reveals flatness over the lower anterior and posterior thorax. The presence of gas gives tympany with obliteration of the lower liver dullness. The line of percussion dullness may

descend with respiration. Dullness may extend anteriorly to the second rib and posteriorly to the middle of the scapula. Auscultation discloses absence of the breath sounds and vocal fremitus over the area of dullness. Above this level for a short space vocal and tactile fremitus may be increased because of compression of the lung. Occasionally there is a pleuritic friction rub. When the abscess contains gas and pus a succussion splash may be elicited by shaking the patient. Fluid in the pleural cavity complicates the diagnosis. When this is present the exploratory needle may obtain first a straw-colored fluid and then pus or pus and gas. The liver edge may be well below the costal margin. Marked leucocytosis is generally present. In certain chronic cases there is a leucopenia.

X-ray and fluoroscopic examinations give the most positive findings in the majority of cases. It may be difficult to determine by the symptoms and physical signs alone whether the condition is a subphrenic abscess, pyothorax, or pyopneumothorax. A high, fixed diaphragm with a persistent costophrenic angle is very typical of subphrenic abscess. The level of the diaphragm may be only slightly raised or may reach to the third rib. The line of the diaphragm is a smooth, regular curve. In cases of liver tumors, abscesses, and adhesions from old pleurisy this curve is more irregular and more sharply localized.

Subphrenic abscess causes weight loss, weakness, and general debility. In cases not operated upon the mortality ranges from 82 to 100 per cent, while in those treated surgically it is 25 per cent.

The treatment is incision and drainage. Abscesses on the left side must always be approached from the front. A left anterior-space abscess is drained through the anterior abdominal wall. A left posterior abscess is drained by a second incision from behind, which may or may not be below the rib margins. Collections on the right side are drained from below the rib margins, or by incision between the lower ribs, or by resection of one or more ribs. To drain adequately one must go through the lower part of the pleural cavity or retract the pleura. A superimposed empyema may be fatal.

The author recommends a two-stage operation under local or general anæsthesia. At the first operation a portion of the tenth rib is resected in the mid-axillary line. If the pleural cavity contains fluid this will then escape. The borders of the incised parietal pleura are sutured with continuous catgut sutures to the diaphragm which presents in the wound. The wound is dressed with vaseline gauze. After forty-eight hours, when the pleural cavity has become walled off by adhesions, an incision into the diaphragm parallel to the parietal incision in the pleura is made under local anæsthesia. The edges are retracted and the pus is located with the finger. A large rubber-tube drain is then inserted and held in place by a suture through the skin or fascia. Tube-drainage is continued for a week or more and followed by drainage by a rubber dam. Too hasty removal of the drain may result in the formation of a secondary local abscess.

The author has no difficulty from bleeding intercostal vessels or rib necrosis, and reports favorable results from the procedure described. The two-stage operation is safer than the one-stage operation because it reduces the chance of empyema to the minimum. WALTER C. BURKET, M.D.

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Winkelbauer, A.: Chronic Non-Suppurative Osteomyelitis in the Adult with Primary Total Necrosis of the Diaphysis (Ueber chronische, nicht eitrige Osteomyelitis beim Erwachsenen mit primaerer Totalnekrose der Diaphyse). *Arch. f. klin. Chir.*, 1922, CXX, 262.

Two cases are reported which speak in favor of Ritter's theory that in osteomyelitis the necrosis is primary throughout its entire extent and that further breaking down of the bone does not result from the suppuration.

In the first case a curettage without any increase of fever was followed by swelling of the entire arm which persisted for two months and then retrogressed slowly following immobilization and the application of heat. The roentgenograms showed osteomyelitic necrosis of the diaphysis of the humerus. In the second case, in which the course of the condition was similar, a cloudy, serous, slightly blood-colored fluid containing staphylococci was obtained on puncture. In three months the albuminous exudate changed into pus.

In neither case did the osteomyelitis show an acute stage. The necrosis of the entire diaphysis, which was roentgenologically demonstrable five and eight weeks, respectively, after the beginning of the disease, speaks in favor of an embolic disturbance of nutrition of the affected bone occurring in the nutrient artery. The severe reaction of the tissue in both cases soon led to liquefaction of the necrosis and the development of a periosteal mantle of bone. In the second case a small sequestrum was removed by operation to hasten healing. The author states that as a rule conservative treatment is advisable in these chronic albuminous forms. BRUNNER (Z)

Barrie, G.: Hæmorrhagic Osteomyelitis. *J. Bone & Joint Surg.*, 1922, n.s. IV, 651.

The author emphasizes the fact that hæmorrhagic osteomyelitis is essentially a benign condition with the characteristics of a mild inflammatory affection. Until comparatively recently it was regarded as malignant.

There is a similarity between the scavenger giant cells of simple hæmorrhagic osteomyelitis and the giant cells of a giant-cell sarcoma. In the former condition there is always an associated low-grade inflammation.

About 75 per cent of the cases are due to bone trauma. Other causes are hæmatogenous infection, bone malnutrition, and endocrine disturbances. The lower extremities are most frequently involved.

Usually the symptoms are mild. There is pain on pressure associated with limping if the lower extremity is involved, and with limitation of motion if the condition is near a joint. The size of the swelling varies according to the area involved.

Grossly, a mass of highly vascular granulation tissue fills the cavity of the bone. Microscopic examination reveals the typical granulation tissue. Some sections show numerous scavenger giant cells, but their distribution is irregular.

X-ray examination is essential. Usually it shows a clean-cut round spot in the cortex. Expansion without breaking of the periosteum is observed. In young persons the condition does not penetrate the epiphyseal cartilage.

In the differential diagnosis acute inflammatory infections of bone, highly malignant processes, chronic bone abscess, true bone cyst, myxoma, and slowly growing fibrosarcoma must be considered.

The treatment consists in removing all exuberant granulations filling the destroyed bone area, and through curettage of the cavity wall. Repair in large cavities is favored by filling the cavity with a bone graft, chips, or a Mostig-Moorhof plug.

FRANK G. MURPHY, M.D.

Masci, B.: Primary Multiple Sarcomata of the Bones (Sarcomi multipli primitivi delle ossa). *Policlin.*, Rome, 1922, xxix. sez. chir., 473.

The author's case of multiple and primary bone tumor was that of a man aged 59 years who had suffered from youth from chronic bronchial catarrh and pulmonary emphysema. When examined by Masci he showed a frontal tumor the size of a hen's egg which had increased slowly and continuously without pain during a period of five months. The growth of the neoplasm was associated with sharp thoracic pains and a cough. Numerous other tumors were found in the cranial bones, the clavicle, the mandible, and the ribs. In the seventh rib on the right side a tumor caused fracture. As far as could be discovered these growths were contemporaneous in their evolution with the frontal tumor. A diagnosis of multiple myelomata was made. Tuberculosis, syphilis, and chronic inflammatory processes were ruled out by the findings and history. The symptoms were essentially and continuously osseous and left no doubt regarding the primary localization of the disease in the bones.

The frontal tumor was removed. The breach in the bone involved both the external and the internal table. The tumor was adherent to the dura. Histologically it seemed to be a round-cell sarcoma.

The author discusses multiple myelomata and sarcoma of the bones and their relationship at length. As his patient had had several injurious falls during periods of intoxication, trauma may have been an etiological factor in the condition.

W. A. BRENNAN.

Rhodes, R. L.: Periosteal Sarcoma in Association with Osteomyelitis; Report of Three Cases. *Surg., Gynec. & Obst.*, 1922, xxxv, 440.

In two of the cases reported there was an ulceration of the skin through which the pyogenic infection of the bone might have entered, and in the other case the malignancy may have developed after the operation for the osteomyelitis. The fact that two of the patients are living and in excellent health over a year after the amputation supports the generally accepted view that the round-cell tumor is not apt to form metastases.

E. J. BERKHEISER, M.D.

Finsterer, H.: A Muscle Angioma of the Deep Musculature of the Neck, the Rhomboideus Minor Muscle (Muskelangiom der tiefen Nackenmuskulatur, Musculus rhomboideus minor). *Wien. klin. Wchnschr.*, 1922, xxxv, 269.

The author reports a case of tumor as large as the fist which developed on the right side of the neck of a girl 19 years old. This growth was an intramuscular cavernous angioma with relatively hard fibrous septa which had its origin in the proximal portion of the rhomboideus minor muscle. It extended from the second cervical vertebra to the first thoracic vertebra and was connected by large venous bands with the vessels of the neck and the deep vessels of the muscles along the vertebral column. It was distinctly compressible. Operation resulted in cure. The differential diagnosis from lipoma, cold abscess, and meningocele is discussed briefly. The diagnosis was established by puncture (dark blood). An early operation is advisable as the tumor may grow and exert increasing pressure on the neighboring organs.

HOFFMANN (Z).

Rogers, M. H.: The Pathology of Tuberculosis of the Joints: A Study from the Clinical Standpoint. *J. Bone & Joint Surg.*, 1922, n.s. iv, 679.

It is taught today that in a large percentage of cases of joint tuberculosis the original focus is in the bone, near or at the epiphyseal line, and that the involvement of the joint is practically always secondary.

As described in the literature, the pathology consists of an invasion of the bone, generally at or near the epiphyseal line, extension toward the joint surface, destruction or absorption of the joint cartilage, and invasion of the capsule.

In an article on this subject published in 1921 Allison agreed with Nichols who stated in 1898 that the bone invasion was the typical pathologic lesion first initiated.

From cases treated at the Massachusetts General Hospital the author concludes that, contrary to

the belief of Nichols and others, synovial invasion occurs first and extension into the bone is secondary.

On the basis of his experience with early arthrotomized knees believed to be tuberculous Brackett classified his cases as being first synovial in type, and later, bony.

Tuberculosis of the hip beginning in adult life is a rare condition in the author's clinic. Rogers has not seen a proved case of tuberculosis in which the end-result was not destruction of bone.

A case cited was that of a patient of 21 years who had an intermittent limp. There was no restriction of motion, but when the hip was opened slight atrophy of the thigh proved to be due to synovial tuberculosis. This operation was done after a diagnosis of tuberculosis had been made by exclusion and a subcutaneous tuberculin test had caused an increase in temperature and a local reaction. No evidence of bone involvement was found, but an excised piece of the capsule showed tuberculosis on microscopic examination.

In an X-ray study of knee cases no signs of a bone lesion were found. Generally the first evidence of bony involvement was a thinning of the articular cartilage and slight irregularity of the cartilage outline. This was followed by erosion of the cartilage. There was loss of bone substance only in late cases.

Two cases of spinal tuberculosis were X-rayed at four-month intervals by roentgenologists. The first year's plates showed no evidence of bone tuberculosis. The symptoms were recurrent pain and stiffness, but there was no deformity. Subsequently both cases developed abscesses, one a psoas abscess and the other a lumbar abscess.

In the X-ray study of early tuberculosis of the spine the first point noticed is the narrowing of the intervertebral space. Later, loss of bone substance appears.

The author's best experience was derived from knee-joint cases. When opened, the knees showed first a reddened, thickened, injected capsule. In the next stage there was a reddish prolongation of the capsule, a pannus which began to cover the inner surface of the condyle and extended over the articular surface of the femur. In the third stage there was extension of the pannus with loss of the underlying cartilage. The last stage was loss of bone substance.

JOHN R. MITCHELL, M.D.

Braizew, W.: Dissociation Processes in the Center of Ossification of the Tuberosity of the Tibia
[Dissociationsprozesse des Knochenkerns an der Tuberositas tibiae]. *Nowy Chir. Arch.*, 1922, ii, 3

The author reports two chronic cases which were completely cured clinically and operatively in less than three weeks. The subjects were boys 16 and 21 years old respectively. In the first case a football injury caused no symptoms but about six weeks later, following a hammer blow on the left tuberosity of the tibia, pain developed. The swelling first appeared after one to one and one-half months. The duration of the disease was six months. The X-ray showed a defect with a ragged base on the anterior surface of the beak-shaped process, and in front of it an isolated oval piece of bone. No proliferative processes were found in the vicinity. The right tuberosity and the epiphysis of the calcaneus tuberosity were normal.

Under anæsthesia the patellar ligament was split lengthwise, the small piece of bone extirpated, the lower portion of the epiphyseal process chiseled off, the tendinous ligament sutured with catgut, the skin wound closed, and a short plaster splint applied. Walking was painless after twenty days.

Microscopic examination of the removed part of the tuberosity revealed a normal, perhaps somewhat weakened, enchondral ossification. The peripheral fibrous cartilage underwent gradual transition into the tendonous tissue of the ligament. In the latter were deposits of tissue rich in cells and blood vessels, but no small-cell infiltrations or other signs of inflammation.

In the second case the disease occurred on the left side. A fall on the knee at the age of 17 years was without results; one year later, when the patient knocked his foot against a door, he experienced a severe but transient pain in the knee. Subsequently swelling appeared which persisted even after the resorption of the effusion of blood. This increased for one and one-half years, then remained constant for one and one-half years, and in the last six months had produced very severe pain during certain movements. The pain radiated to the whole leg, especially when the patient rested on the foot with the knee bent. The roentgenogram of the affected knee, in contrast to that of the normal knee, showed an isolated center of ossification in the middle third of the epiphyseal process which corresponded at the surface with a smaller trough-shaped defect. The operation and after-treatment were the same as in the first case. Rest in bed was ordered for one week. In the second week it was discontinued and a short, anterior plaster splint applied. By the third week a complete subjective and functional cure had been obtained. Histologic examination revealed an almost complete normal enchondral ossification. The extirpated hemispherical bone swelling represented to a certain extent a marrow cavity infiltrated by a few bone trabeculæ and enclosed by a shell of bone showing excavations. There were no signs of inflammation.

The author regards trauma as the exciting factor acting directly from without or through the aid of a quadriceps contraction and causing avulsion of the center of ossification. The regressive and hyperplastic changes found on microscopic examination by Jakobsthal, Matsioka, Mintz, and others may be produced mechanically and are not true anomalies of ossification. In Braizew's opinion the assumption of a predisposing or secondary epiphysitis is not well grounded. Braizew, however, did not make serial sections as did Ebbinghaus who supports this theory and obtained excellent results with more radical treatment.

VON DER OSTEN-SACKEN (Z.)

Herzen, P.: Acromegaly from the Surgical Standpoint (Ueber Akromegalie vom chirurgischen Standpunkt). *Nosy Chir. Arch.*, 1922, ii, 85.

This article is based on the following case:

The patient was a peasant 48 years old who gave a history of alcoholism. He had married at 18 years of age. His wife had aborted once and had borne five children. All of the children died early. The patient acquired syphilis during his twenty-second year but was cured. For fifteen years he suffered with severe headaches. For ten years he noticed an increase in the size of his face, hands, and feet but there had been no further increase in the last few years. Five years before he was seen by Herzen he had been operated upon, a large frontotemporal flap being cut on the right side. According to the surgeon's report the sella could not be reached.

The patient was of massive build and tall. The lips and tongue and the skeleton and soft parts of the face, the hands, and the feet were markedly hypertrophic. The skin was everywhere hairless, dry, and inelastic, and its papillæ were enlarged, broadened, and sclerosed. The subcutaneous fatty tissue was soft and hyperplastic, especially in the mammary regions. The patient complained of continuous headache and apathy. Other conditions were weak eyesight without limitation of the visual field, slight myosis, and tardy reaction of the pupils. Sensory and motor disturbances were absent but there was no knee reflex or Achilles tendon reflex. The thyroid gland was not palpable. The penis and scrotum were flaccid and the testicle was atrophic. The patient had been impotent for ten years.

The roentgenogram showed an enormous enlargement of the mandibles, the supra-orbital arches, and the frontal sinuses, and marked widening and deepening of the sella turcica. The posterior clinoid processes were indistinct.

The author considers it possible that the adynamic, myxœdema-like symptoms in this case, insofar as they were not due to a secondary stage of pituitary hypofunction, were the result of the atrophy of the thyroid gland and testicle.

Herzen is opposed to the intracranial operative procedures as they are not based upon embryological development and they open the thin and occasionally broken wall of the sphenoidal sinus in the presence of a frequently unavoidable lesion of the floor or the anterior wall of the sella turcica, in this way destroying asepsis. The various endonasal methods are equally unreliable.

In the case reported the author operated according to the Giordano-Schloffer method. He reflected the nose laterally with an osteoplastic flap 4 cm. broad taken from above, split the septum from the floor of the frontal sinuses downward and backward, and resected the septum, the upper and middle turbinate bones, and the ethmoidal cells. He was unable, however, to distinguish the anterior wall of the sphencidal sinus distinctly and did not reach the sphenoidal sinus. He cut through a fairly thick layer of bone near the anterior wall of the sella turcica, partially opened the latter, split the smooth dura protruding in front of it (whereupon no spinal fluid escaped), and removed with a spoon about 5 gm. of a colloidal substance. The upper border of the hypophysis, which showed a neoplastic change, was not reached and no attempt was made to reach it. Iodoform gauze strips were laid in the sella, as advised by Kocher, the nasal cavity was packed, and the nose and the flap of skin and bone removed from the anterior wall of the frontal sinus were sutured back into place. Primary union resulted.

Rhinoscopic examination, which was done later, showed only a few pale granulations at the upper roof of the nasopharynx at the base of the skull. A probe entered the cavity of the sella turcica freely without causing any bleeding or escape of serous fluid. The headaches disappeared. Even at the end of the first week a diminution in size was observed in the face and fingers and later was noted in the tongue and feet. The color of the skin became normal, the thyroid gland became palpable, and the apathy decreased markedly. Vision and the pupillary reaction, however, remained unchanged.

Microscopic examination showed that a fairly large glandular flap had been removed in addition to a considerable amount of secretion. The main mass consisted of a conglomeration of round basophile cells with round nuclei and almost no interstitial substance, which was interrupted only by broad thin-walled blood vessels and large, granulated round eosinophile cells. In addition, the specimens showed hollow spaces filled with colloid which were lined by a single layer of cubical epithelium.

VON DER OSTEN-SACKEN (Z)

FRACTURES AND DISLOCATIONS

Mitchell, A. P.: Ununited Fractures Due to War Injuries: With End-Results of Operative Treatment in 100 Cases. *Brit. J. Surg.*, 1922, x, 259.

In sixty-one of the cases reviewed the author performed the primary operation; twenty-four cases had been operated upon previously by other surgeons.

The gap between the fractured ends measured 1 to 2 cm. and was filled with fibrous tissue. The surrounding soft tissues showed fibrosis and bled easily. The fragmented ends were often tapered, brittle, and sclerosed.

Local causes for non-union were: primary loss of substance, fifty-five cases; displacement, twelve cases; sclerosis and latent sepsis, five cases; sclerosis with plating and wiring, four cases; sclerosis and gap, twelve cases; and sclerosis alone, twelve cases.

Pre-operative treatment was employed in attempts to overcome deformities resulting from sepsis, nerve injury, or limitation of motion in the joints.

As it was impossible to determine when gunshot wounds were free from latent sepsis, no operation was attempted until the wound had been healed for

twelve months. Most of the wounds were healed for fifteen months before operation was performed. Latent infection was encountered in six cases. A two-stage operation was done when prolonged sepsis of the original wound had resulted in extensive scarring of the tissues at the site of the non-union.

At the preliminary operation by the author, all sclerosed tissue was completely excised. The wound was then closed and the grafting done fourteen days later.

Infection and a successful graft were not incompatible, but the chief cause of failure was sepsis.

Success is impossible unless the following principles are adhered to: (1) a skin incision of sufficient length, (2) the complete excision of scar tissue, (3) an extensive surface of contact between the graft and the host bone, (4) the preparation of a healthy muscle bed, (5) the avoidance of metallic or non-absorbable sutures, (6) perfect hæmostasis and strict asepsis, (7) plaster-of-Paris immobilization until firm osseous union has occurred.

Most satisfactory was the use of the autogenous tibial graft including periosteum, compact bone, and medullary tissue. In a few cases grafts freed of periosteum were used. These also proved satisfactory. Periosteum facilitates secondary vascularization of the graft and protects the graft if latent sepsis is lighted up.

The graft must be long enough to have wide bony contact across the gap. The grafts employed were usually from two to three times the length of the gap.

To describe the method employed the author uses the ulna operation as an example. A skin incision of sufficient length was made along the postero-internal border between the flexor and the extensor carpi ulnaris. All scar tissue was excised, the fractured ends were exposed, and all sclerosed and ragged bone between the fragments was removed. The muscles, with the periosteum, were stripped from the bone fully 2 in. from the fractured ends and for practically one-fourth of the circumference of the bone. A thin layer of bone was removed with an osteotome the full length of the exposed bone, deep enough in places to expose the medullary canal.

Interrupted sutures of strong tanned catgut were passed through the reflected periosteum and muscle on either side of the prepared bed and a pliable probe was laid in the defect and bent to the exact length of the graft required. A graft equal to the length of the bent probe was removed from the outer side of the anterior border of the tibia by means of a circular saw and transplanted immediately underneath the catgut loops. The ligatures were then tied and the skin wound was closed with interrupted silkworm-gut sutures.

Plaster-of-Paris was used for immobilization for a period of six weeks. At the end of this time the stitches were removed and a second cast was applied after an X-ray examination. At the end of three months the plaster was dispensed with.

Non-union of the radius is more important than non-union of the ulna and occurs most frequently in the lower half of the bone. The exposure of the radius for operation is done best along the line which separates the radial extensors of the wrist from the extensor communis digitorum. To secure proper alinement it is necessary to lever the lower fragment away from the ulna and rotate it into the supinated position.

The graft is applied preferably to the posterior surface. In fractures above the level of the pronator radii teres the proximal fragment is completely supinated and the distal fragment is pronated. A modified intramedullary peg proved most satisfactory; one end of the graft was pegged into the medulla of the proximal fragment and the other fitted into a gutter made in the short distal fragment.

Ulna non-union is of frequent occurrence. In some cases the disability is so slight that bone grafting is unnecessary. Non-union in the lower part of the shaft has little effect on the use of the hand.

Non-union of the humerus occurred in ten of the author's cases. Non-union is more frequent in this bone than in any other. The reason is difficulty of fixation. The autogenous bone graft cannot be so generally employed in the humerus as in the radius, ulna, and tibia, and bone grafting is of little value. Regardless of arm shortness, the most successful method is the step-cut operation.

In fractures of the tibia with an intact fibula there is usually little displacement. In fractures of the tibia with an old fracture of the fibula at the opposite point the displacement is more marked and is frequently angular. The lower fragment usually shows a certain degree of rotation on the long axis of the bone, resulting in internal or external displacement of the foot.

Non-union of the femur is rare. The site of non-union in the author's three cases was about the middle third of the shaft.

Seven graft fractures occurred in the series of eighty-three cases. All but one were massive tibial grafts.

JOHN MITCHELL, M.D.

Merrill, W. J.: The Davis Method of Reduction of Congenital Dislocation of the Hip Joint. *J. Bone & Joint Surg.*, 1922, n.s. iv, 805.

Davis' method of reducing congenital dislocation consists of four phases.

In the first phase the child is prone with the leg to be manipulated hanging down close to the side of the table. An assistant fixes the pelvis by making pressure on it downward and toward the operator. A second assistant, under the direction of the operator, grasps the foot and knee, flexes the knee, flexes the thigh on the abdomen, rotating it inward, and makes pressure toward the femoral head in the line of the femoral axis while keeping the thigh close to the trunk. At the same time the operator exerts pressure upon the trochanter downward and toward the ischial tuberosity. Internal rotation relaxes the Y ligament and the external rotators.

During the second phase the operator grasps the knee and trochanter, extends the thigh downward toward the transverse plane of the pelvis, abducts the thigh, and makes pressure on the trochanter toward the acetabulum, at the same time gently rotating the thigh in and out. If the head then does not cross the brim into the acetabulum, the leg is placed in the position of the first phase and the head is pushed downward to the obturator groove. Resistant cases often require long-continued pressure to carry the head across the brim or through the obturator groove.

When the head is at the thyroid foramen, external rotation and extension are made to carry the head upward through the cotyloid notch. This last step completes the third phase.

In the fourth phase a cast is applied. This includes the entire extremity and the thigh of the opposite leg. When the dislocation is unilateral it is extended also to the lower thorax of the opposite side. The same form of dressing but without the lateral upward extension is used for bilateral luxations. The final position in the average case is one of flexion, internal rotation, and abduction of the thigh.

The author states that in resistant cases Davis used extreme flexion, abduction, and internal rotation until the resistant structure yielded, and then forced the head into the acetabulum.

Flexion, abduction, and rotation were maintained until the X-ray and other clinical evidence indicated that the head, neck, and acetabulum would sustain weight-bearing. The first cast was removed at the end of three or four weeks. Casts or splints or an abduction brace maintained the desired position until the roof of the acetabulum was capable of retaining the head.

Each case is handled according to the condition found. There is no fixed time for bringing the leg to the midline and establishing function.

JOHN R. MITCHELL, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Brandt, G.: The Treatment of Acute Osteomyelitis (Zur Behandlung der akuten Osteomyelitis). *Deutsche med. Wchnschr.*, 1922, xlviii, 972.

At the Halle clinic osteomyelitis has been treated in various ways by the different directors (Braman, Schmieden, Voelker) during recent years. For the purpose of subjecting to critical analysis the question whether the abscess should be opened with a chisel or by simple incision, the author collected the material of the clinic for the last twenty years (304 cases in which there were seventy-eight deaths, a mortality of 25.65 per cent.)

He concluded that in the majority of cases of acute osteomyelitis incision of the subperiosteal abscess is sufficient, chiseling of the medullary cavity being necessary in only a small number. The latter may be done also at a secondary operation. The dissemination and progression of the phlegmon of the soft parts and joint complications must be taken into consideration first of all. The bone should be chiseled open when the cortex is compact (old patients, rachitic children). The more extensive the subperiosteal process, the more readily may it be assumed that the outflow of pus through the haversian canals is sufficient and that the process is localized chiefly at the periphery of the bone.

VON REDWITZ (Z.)

Gaugele: Osteotomy or Osteoclasis? Also a Discussion of the Springer Operation (Osteotomie oder Osteoklasie? Zugleich Beitrag zur Springerschen Operation). *Arch. f. orthop. u. Unfall.-Chir.*, 1922, xx, 40.

After having twice experienced infection of an osteotomy wound, the author prefers osteoclasis, a procedure which is always satisfactory when the proper treatment in the florid stage of the rachitis has been carried out. Under such conditions the new methods of Springer and Loeffler are unnecessary. As the early treatment of the rachitis is even more important than the early treatment of the deformities, the author admits to his hospital for cripples infants 6 to 8 months old. SIEVERS (Z).

Goljanitzki, I.: The Surgical Treatment of Traumatic Pseudarthroses: Two New Methods of Operation (Zur chirurgischen Behandlung traumatischer Pseudoarthrosen: Zwei neue Operationsmethoden). *Nowy Chir. Arch.*, 1922, ii, 15.

A successful result is dependent not only on the structure of the transplant but also on the method of transplantation. In four cases the author obtained no result with an autoplastic bone peg.

In the recent war it was noted that, in spite of associated injury of the soft parts, virulent infection, the expulsion of numerous sequestra, and insufficient immobilization, bony union of gunshot fractures occurred more frequently following extensive splintering than when the bone was not greatly shattered. As this indicates that the regenerating power of bone is greater the greater the separation of continuity, Goljanitzki has introduced the principle of greater traumatization as a new factor in the treatment of pseudarthroses in cases with extensive cicatrices, considerable degeneration of the ends of the fragments, and doubtful asepsis.

As much of the cicatricial tissue as possible is removed, the fragments are somewhat freshened, and then, with a chisel or bone shears, an adequate longitudinal splitting of the bone ends up to the opening of the marrow cavities is done. When the diastasis is slight the impaction of the fractured ends of the bones in opposing slits is successful, but when the intervening space is larger it is filled with free bone fragments taken from the same site or elsewhere. Two pseudarthroses of the leg, two of the forearm, and one of the upper arm, and one flail joint of the elbow were treated by this method with good results.

If the cicatricial tissue disturbing the nutrition and regeneration cannot be removed and if the atrophy and sclerosis of the fragments have advanced too far, this method fails. For such cases the author proposes a "collateral restoration" of the diaphysis in its entire extent with embedding of the implant of healthy tissue from epiphysis to epiphysis. This new method he used in a case of gunshot fracture of the radius with a diastasis of 6 cm. in which the defect of the soft parts produced a cicatricial formation which could not be overcome by any other measure. Proceeding from a dorsal incision, he exposed the proximal and distal epiphysis intermuscularly, chiseled through the diaphysis and pushed it aside, and fastened a piece of the fibula 16 cm. long to the epiphyses with periosteal sutures. No ligation of vessels was necessary. After four months, the bone had healed in firmly and function was completely restored.

The new and valuable feature in this procedure is not the total exchange of bones, but the fact that the operation is performed in healthy tissue, the region of the pseudarthrosis is left intact, and a bone is added. VON DER OSTEN-SACKEN (Z)

Monaco, A.: Operative Measures to Mobilize Ankyloses (L'intervento operativo nelle anchilosi al fine di mobilizzarle). *Ann. ital. di chir.*, 1922, i, 543.

Some surgeons, among them Schepelmann and Roux, deny that the interposition of tissue between the surfaces of ankylosed joints is of any value in restoring function. The good results following such procedures they attribute to the modeling of the joint surfaces. In thirty-six cases of ankylosis Schepelmann obtained good results without the interposition of tissue. The technique of this type of operation is as follows:

After separation of the ankylosed ends, 2 or 3 cm. of bone, all remaining cartilage, and any periarticular ligaments and cicatricial tissue are removed. The bone ends are then fashioned with the gouge as well as possible to fit the function they are to fulfill. The detached apophyses are fixed with screws, nails, or sutures, the tendons are reconstructed, and the soft parts are closed.

Postoperative treatment for two or three months is necessary. This consists of immobilization followed by passive movement, active movement, and muscular faradism. W. A. BRENNAN

Fraenkel, J.: The Origin and Treatment of Congenital Muscular Torticollis (Zur Entstehung und Behandlung des angeborenen muskulaeren Schiefhalses). *Arch. f. klin. Chir.*, 1921, cviii, 228.

The old Stromeyer theory that muscular torticollis as well as sternocleidomastoid tumor is a consequence of trauma occurring at birth is untenable. It was pointed out by Petersen that a ruptured muscle heals with lengthening rather than with shortening. One theory of the pathogenesis of torticollis assumes the rupture of a muscle shortened during intrauterine life. If this were correct the torticollis would be the predisposing cause rather than the consequence of the rupture. Even the normal sternocleidomastoid is easily injured in spontaneous delivery. Such injury is due less to longitudinal extension than to twisting (Kuestner). The sternocleidomastoid tumor has its origin in hæmorrhage, while the histologic changes in the muscle in torticollis are referable to ischæmia (Voelcker). When all is said, the rôle of torsion, the ischæmia, and the hæmorrhage are well explained by the peculiar blood supply of the sternocleidomastoid muscle, since only a few arteries, with very few anastomoses, enter the lower two-thirds of this muscle, and when the neck is twisted these are easily shut off.

In favor of the primary intra-uterine origin is the occasional familial or hereditary appearance of the affection and its association with other congenital deformities.

Very significant is the frequency with which torticollis appears in the first born, particularly when the mother is an elderly primipara. Abnormalities of the maternal organism, unyielding uterine walls, and the disproportion between a large fœtus and a small uterus favor the development of torticollis and club-foot, and breech presentation. Hence torticollis is not the consequence of breech delivery, but due to the same condition, too little space within the uterus.

Since torticollis is not confined to the sternocleidomastoid contracture but also deforms the face and interferes with the development of the spine, prompt treatment, usually operative, is demanded. It should be borne in mind that the contour of the sternocleidomastoid determines the beauty of form of the throat and must therefore be retained.

According to the author's method, the muscle can be operated on at any point, above, in the middle, or at its lower insertion, without sacrificing the cosmetic result and with retention of the old simple method of transverse open myotomy. The division of the fascia demanded by Mikulicz is not necessary. The author's method is built upon sparing of the layer of fascia. On the other hand, the sternocleidomastoid muscle must be completely divided. Particular attention must be paid to its adhesion to the posterior wall as otherwise recurrence is favored.

Local anæsthesia is not recommended as it prevents a general view of the tissues. The skin incision over the sternocleidomastoid tumor runs over the apex of the swelling in one of the natural transverse folds of the skin. In late operations it runs close and parallel to the clavicle over the insertion of the muscle which projects the most. The platysma muscle and the anterior layer of the superficial fascia of the neck are very thoroughly divided until the muscle is entirely exposed. The muscle is then lifted out of the bed of the posterior layer of fascia with Deschamp's blunt instrument and divided. The slight hæmorrhage is not stopped, on the contrary, the sac of fascia is allowed to become filled with blood so that it may be thus kept open, and its

previously divided anterior layer is sutured longitudinally over the hæmorrhage. The muscle is not resected, its ends draw apart of themselves and the extravasated blood forms the new connection.

Following the operation a plaster-of-Paris dressing is applied in the corrected position and left on for three weeks. By the end of three weeks the extravasated blood is transformed into a soft substitution tissue. The after-treatment consists merely in methodical lateral flexion of the head and drawing back of the shoulders. This should be continued for three months.

Subsequent examination of patients operated on in the manner described has shown excellent permanent results. PAETZOLD (Z.).

Hamilton, G.: An Operation for Lengthening Bone. *Texas State J. M.*, 1922, xviii, 293.

Hamilton has lengthened the femur in two cases. In one, the increase was 2 in, and in the other, a little more. These patients have passed from his observation.

The technique consisted in dividing the femur and sliding one fragment on the other until the desired length was obtained.

It is generally believed that the same result may be obtained gradually as by Putti's method, but in the author's opinion the shortening of the soft structures would make this impossible.

E. J. BERKHEISER, M.D.

Kropveld, S. M.: Experiments in Bone Transplantation (Experimentelle Beitraege zur Frage der Knochentransplantation). *Nederl. Maandschr. v. Geneesk.*, 1921, x, 684.

Ununited fracture of the neck of the femur has always been a difficult condition for the surgeon. In 1905, Lanz employed screws in a case of this kind. Later, Koch obtained good results with an ivory peg. In 1893, Lanz transplanted the fibula in a case in which the tibia had been destroyed by osteomyelitis. In 1912, Albee published a large number of experiences on the transplantation of bone. In Holland, Noordenbos has brought the method into favor.

It is still uncertain whether bone transplantation gives a perfect cure in fracture of the neck of the femur. The author has studied in particular the questions whether it is necessary or advisable to leave the periosteum on the transplant, and whether living bone possesses advantages over dead bone. He experimented on dogs, in which he fractured the femur just beneath its head. Eleven such experiments with transplantation of the fibula with and without periosteum are reported in detail.

The microscopic examinations show that signs of necrosis appear very early in the transplanted fibula. At the end of two weeks the greater part of the transplanted bone is dead. There is still some doubt regarding certain zones lying close to the outer margin. That the groups of cells around the haversian canals remain alive has not been proved. It is practically certain that at the end of about one month the last cell groups are dead, but it is possible, of course, that here and there a cell group has escaped necrosis. The greater part of the periosteum of the fibula remains alive. After a short time the richly cellular layer of the periosteum begins to proliferate. At first the outermost fibrous tissue layer is pressed upward, whereupon the cells in this situation vanish. At the same time this tissue sets up resorption in the transplant. Large lacunæ are formed, and free giant cells make their appearance. The same tissue, together with blood vessels and connective tissue, grows into the haversian canals; the latter widen out into large spaces in which resorption takes place.

New bone formation is now seen. Not only the surrounding bone but also the transplanted periosteum begins to form new bone. At first there is a distinct difference between the new bone formed from the periosteum and that formed from the surrounding bone. The same destruction and building up occur in the bone marrow of the transplant. Thus the entire transplanted piece of bone is slowly destroyed and replaced by new bone. It is difficult to determine how long this process goes on. The specimens show that it is not completed at the end of six months.

The bed of the transplant reacts in a similar manner. The formation of trabeculæ begins rather early in the neighboring compact bone and is more marked on the side facing the transplant than on the upper side. Later the transplant becomes healed in a network of spongiosa which joins its newly formed layers. The same is true of the preparations transplanted without periosteum as well as of those with periosteum. Of course in the former there can be no periosteal proliferation, and the entire process of destruction and rebuilding takes place from the neighboring bone. A comparison of the specimens shows that in such case the process is rapid. It is to be remembered that in the transplant without periosteum the osteoblast-bearing tissue is not removed but requires some time for regeneration.

As regards the head of the femur, the experiments show that for the most part it remains alive. It is not known definitely how much time is required for regeneration when the transplant is without periosteum as this depends on the extent of the necrosis and on function. The cartilage of the head of the femur remains alive. It seems to be established that in man the layer of osteoblasts remains attached to the periosteum, just as in bone regeneration following subperiosteal resection of a rib. Conditions seem to be the same when the transplant is taken from the tibia.

In conclusion the author states that in fracture of the neck of the femur an ivory transplant serves as well as a bone transplant. KOCH (Z.).

Michon, L.: A Contribution to the Study of Bone Transplantation (Contribution à l'étude de la transplantation osseuse). *J. de chir.*, 1920, xx, 260.

The author has made an experimental and clinical study of the application of bone transplantation to the repair of the metacarpals and phalanges. The

clinical study was based on a case of metatarsal transplantation performed by Cunéo, and the experimental transplantation was done on dogs. Cases reported in the literature are also reviewed.

The histologic examinations in the experimental cases showed large spaces between the haversian canals in which there were no osteoblasts. The disappearance of osteoblasts is a certain indication of the death of the corresponding part of the transplant.

Osteoblasts are found in the immediate vicinity of the periosteum, near the medullary cavity, and in some of the haversian canals. Some of them are evidently disappearing, but others (especially those near the periosteum) are destined to live. It is possible that the latter are nourished by osmosis but it must be admitted that when a segment or an entire bone is transplanted, the transplant always disappears.

In the cases of autotransplantation done in the author's experimental work there was always a tendency toward absorption whether a segment or an entire bone was used. This varied, however, according to the type of transplant. When there was good contact with the host bone only histologic examination showed the process of absorption, but when contact was imperfect the absorption was very marked. When an entire bone was transplanted absorption was much slower. From these facts it seems reasonable to conclude that the agents of absorption are not cells of the transplant which remain alive and become changed into osteophages. The latter may be derived from the host bone or the connective tissue in the vicinity.

Michon's findings in experimental work with entire bone transplants convinces him that total transplants die and become absorbed.

The foregoing applies to fresh bone transplants. Dead bone transplants tend to become eliminated. If elimination does not occur they become encysted and their absorption is slow.

The histologic examinations show not only that transplants die, but also that when there is intimate contact between the transplant and the host bone absorption is retarded. In the latter case the transplant persists in its first form, constituting a framework for the new bone formed by the host bone. The new bone is progressively substituted for the old bone. The stage of replacement of the transplant is preceded by revascularization of the haversian canals.

The author applies his findings to the various types of reparative operations on the hand.

W. A. Brennan.

SURGERY OF THE SPINAL COLUMN AND CORD

Goecke, C.: The Diagnosis of Traumatic Diseases of the Spinal Column and "Insufficientia Vertebræ" (Schanz) (Die Diagnose der traumatischen Wirbelsaulenerkrankungen und die "Insufficientia vertebrae" [Schanz].) *Arch. f. klin Chir.*, 1922, cxix, 787.

The author reports the results of his studies of diseases of the spine in wounded soldiers: (1) organic diseases of the spine without nervous disturbances, (2) organic diseases of the spine with nervous disturbances, (3) functional neuroses without organic disease of the spine.

Strain fractures of the vertebral bodies are frequently unrecognized as the later symptoms may be remarkably slight. Fractures in which the vertebral processes are broken off are also often diagnosed erroneously. In many cases the breaking off of the transverse process is an indirect fracture due to sudden muscle pull and twisting. In these unrecognized cases the condition is wrongly regarded as insufficientia vertebræ.

The pathology of compression of the intervertebral disks is not definitely known. Measurement of the distance between the vertebræ gives some clue regarding the presence of the condition. It is very difficult to determine the loss in thickness of the disks exactly. Compression of a single cartilaginous disk is very rare. Gunshot fractures are easy to diagnose from their results.

With regard to inflammatory conditions of the spine the author states that in cases of tuberculosis it may be difficult to make a diagnosis from the very early symptoms, and the question of trauma may further increase the difficulty. Chief among the chronic deforming inflammations is spondylitis deformans. This is well known and has been frequently described. It is found most commonly in the thoracic or the lumbar spine. It is a primary degeneration of the cartilaginous disk with irritation. Bechterew's chronic rigidity and Struempell's ankylosis of the spine are well known. Trauma is often recognized as the cause. Congenital predisposition frequently plays a rôle.

In injuries to the spinal column with nervous disturbances, a heightened nervous susceptibility to disease must be assumed. Functional neuroses may be associated with any variety of organic disease of the spinal column. Even slight organic changes in the spine in scoliosis are often associated with nervous symptoms. Without doubt, an important rôle is played by meningitis serosa circumscripta.

Payr's study of the pathology of the spine throws light on its developmental disturbances and susceptibility to disease. Multiple sclerosis is an important factor in diseases of the spine and organic nervous diseases. Persons with functional neuroses following accidents and without organic spinal disease are neurotics who are especially predisposed to functional diseases. In Schanz's insufficientia vertebræ the transition is uninterrupted from slight nervousness to mental disease originating in trauma.

Koch (Z.).

Brown, L. T.: Beef Bone in Stabilizing Operations on the Spine. *J. Bone & Joint Surg.*, 1922, n.s. iv, 711.

Brown reports the use of a heterogeneous bone transplant, such as beef bone, in stabilizing operations on the spine.

Thirty-four cases are cited, all of which were operated upon by members of the orthopedic staff of the Massachusetts General Hospital and by practically the same technique. Twenty-nine were cases of tuberculosis of the spine, four were cases of fracture of the spine, and one was a case of anterior poliomyelitis.

Twenty-one of the patients were males, and thirteen were females. Their ages ranged from 13 to 47 years. The duration of symptoms before operation varied from six months to fifteen years. In 20 per cent of the cases of tuberculosis two distinct foci were found in the spine.

The splints were made from beef ribs cut at right angles to their flat surfaces to form two cortical layers with a cancellous layer between. The rib was boiled for an hour before the splint was removed. The splint was then boiled twice for an hour at twenty-four-hour intervals. The operation consisted in most cases of a combination of the spine splitting and the fusion operation. The usual postoperative care was given.

In a review of the cases from one to four and one-half years after the operation it was found that nineteen of the patients were in excellent condition, four had died, four were not benefited, and four were operated upon again, two because of fracture of the splint and two because of secondary foci. In three cases the splint was removed. In ten cases an X-ray examination made from one to four years after the operation showed the density of the spine and splint to be unchanged. In eight there was no change in the size of the splint. In one case slight hypertrophy of the splint was suggested. In thirteen cases the X-ray showed that the splint was in place, and in five cases it revealed a break in the splint.

In the cases re-operated upon no evidence of irritation or inflammation was found around the bone splint. In one case the cancellous portion of the splint was replaced by connective tissue, and in two cases the splint seemed to be attached to the spinous processes. In no case had the spinous processes become fused together. Histologic examination of a specimen obtained at these operations showed no evidence of new bone formation in two cases, slight evidence in one, and active proliferation in one. The author's conclusions are:

1. The use of beef bone does not increase the operative risk.
2. The splint is tolerated by the body.
3. There are certain technical advantages in the use of beef-bone splints.
4. A disadvantage of the method is that regeneration is slow.
5. The dead bone is a sequestrum.

JOHN W. POWERS, M.D.

Boisseau, A., Lhermitte, J., and Cornil, L.: A Case of Complete Section of the Dorsal Cord by Direct Contusion: An Anatomo-Pathologic Study (Sur un cas de section complète de la moelle dorsale par contusion directe, étude anatomo-clinique) *Rev. neurol.*, 1922, xxix, 902.

Since the war, various reports have shown that complete section of the spinal cord may be followed by functional recovery in the lower spinal trunk and that the automatic and reflex activity of the segment below the lesion may be indicated by a series of manifestations of great physiological interest.

The authors' case was that of a man who received a gunshot injury in June, 1918, and survived until January, 1921, when he committed suicide. Autopsy showed a complete break in the dorsal spine extending over two segments. After a period of absolute paraplegia with retention of urine and anæsthesia extending to the ribs which persisted for about seven months the clinical picture was modified by the appearance of defensive and automatic medullary movements, reflex micturitions, and erections. The tendon reflexes and the muscular tonus increased. Twenty days after the injury the tendon reflexes were absent but eighteen months later they were present on both sides and apparently increased.

Besides the reflexes of medullary automatism the authors noted in this case spontaneous automatic movements analogous to those in total section of the dorsal cord described by Lhermitte. Eight months after his injury the man moved his lower limbs often without apparent cause but with precise synchronism every two seconds. Recovery of bladder function was indicated by the reflex micturition.

The survival of thirty-one months in this case is one of the longest on record in a case of complete traumatic section of the cord. The autopsy showed that the complete necrosis of the cord was due to direct contusion of the spinal axis caused by the passage of the projectile.

The case offers further proof that after the first period of shock or medullary coma there is a long period during which the restoration of spinal automatism is indicated by the appearance of tendinous, defensory, and other reflexes. Sooner or later, however, the kidneys are attacked by ascending nephritis. This probably would have occurred ultimately in the authors' case. W. A. BRENNAN.

Stewart, T. G.: Some Observations on the Symptomatology of Spinal Tumors and Compression Paraplegia. *Med. Press*, 1922, n.s. cxiv, 304, 325.

The author describes the signs and symptoms of lesions of the various anatomical parts of the spinal cord and gives a table showing motor localization in the spinal cord and a chart showing the segmental distribution of the spinal roots.

When the spinal fluid is cut off by compression it varies in color below the lesion from a pale straw to a deep green and coagulates rapidly. This may occur

also in cases of spinal tumor, meningitis, and Pott's disease.

The level of an extra-medullary lesion may be determined on the basis of the local signs of spinal deformity and root involvement and by the remote signs of changes in the reflexes.

Disturbance of the sympathetic system may be caused by a lesion of the eighth cervical root or the upper two dorsal roots. The symptoms may be due to irritation (exophthalmos and dilation of the pupil) or paralysis.

The author describes the symptoms and differential diagnosis of various forms of compression paraplegia as follows:

1. Leptomeningitis. The cause of this condition is generally unknown but may be syphilis. Leptomeningitis usually occurs after the fortieth year of age. Chronic leptomeningitis with thickening may cause pressure on the cord or interfere with its circulation. The symptoms are widespread and indefinite. There is a slight degree of bilateral spastic weakness associated with difficulty in micturition, subjective sensations of numbness, and tingling around the body without detectable sensory loss. The onset of the condition is gradual and its progress slow. When there are adhesions and the cerebrospinal fluid is obstructed the dura may be distended above the constriction. Pulsations are visible above, and absent below, the constriction. The arachnoid may be adherent to the cord. A local collection of cerebrospinal fluid may form an arachnoid cyst. These cases begin with diffuse symptoms, but develop signs of a definite level of compression.

2. Pachymeningitis. This condition may be due to syphilis or tuberculosis. In other cases the cause is unknown. When it is due to syphilis it is usually secondary to spinal lues or a local gummatous condition. As a rule the cervical and lumbar spines are affected. When the condition is tuberculous it generally results from the direct extension of spinal caries. Root symptoms occur first and are the most prominent. Pain is followed by weakness, muscular atrophy, and loss of sensation. Cord symptoms appear two or three months after the onset of root symptoms. When the condition is unilateral there is a Brown-Séquard syndrome; when it is bilateral, compression paraplegia ensues.

3. Circumscribed slowly growing intrathecal tumors. These growths are neurofibromata, fibrosarcomata, endotheliomata, or psammomata. They are attached to the inner side of the theca, to the arachnoid, nerve roots, or pia mater. They tend to grow in a spindle shape parallel to the cord, between the anterior and posterior roots, and to indent the lateral columns. The majority are located in the cervical and upper dorsal regions. The course of the symptoms depends upon the part of the cord compressed. As the pressure increases, typical paraplegia with motor and sensory symptoms and changes in the reflexes develop. There are no sphincter disturbances when the Brown-Séquard syndrome is present but these appear when the pressure is bilateral.

4. Diffuse intrathecal tumors. These growths are generally sarcomata of the sacral or dorsal regions. Dorsal region tumors are usually secondary to mediastinal growths. As a rule the growth develops before the twentieth year of age. Root symptoms are early, severe, and rapid. After the development of cord symptoms the lesion rapidly becomes complete. Sacral region tumors cause perineal pain, loss of sensation in the sacral region, incontinence of urine and fæces, wasting and paralysis of the lower extremities, and loss of the deep reflexes.

5. Extrathecal growths. These include hydatid cysts, sarcomata, fibrosarcomata, endotheliomata, psammomata, and lipomata. The majority arise in connection with the roots or the theca in the middorsal region. Fibrosarcoma, and endothelioma occur most frequently between the ages of 30 and 50 years. Lymphosarcoma and round-cell sarcoma occur about the age of puberty. The spinal symptoms consist of pain in the back referred to the region of the tumor. Local tenderness and deformity of the spine are rare. So also are root symptoms. Cord symptoms are usually bilateral and begin gradually. Rapidly growing extrathecal tumors are usually sarcomata and carcinomata. Root symptoms are practically always present and spread rapidly from one side to the other. Bilateral cord symptoms develop soon after the root symptoms, and a complete transverse cord lesion quickly appears.

6. Diseases of the spine which give rise to compression paraplegia. These conditions are tuberculosis, sarcoma, and carcinoma. The author describes the symptoms and course of tuberculosis of the spine and its relation to compression paraplegia. The tuberculous abscess may compress the cord against the vertebral column or a tuberculous pachymeningitis may be set up with the formation of adhesions between the cord, meninges, and diseased vertebræ. Relief of the pressure may lead to an astonishing recovery of function. Hyperæsthesia at and above the level of the lesion points more to an infective myelitis than simple compression. Carcinoma of the spine is always secondary, usually to cancer of the breast, stomach, intestines, rectum, uterus, prostate, lungs, kidneys, suprarenals, or thyroid. Most metastases occur within eighteen months to five years. Metastases may be more or less generalized, affecting several vertebræ and pelvic bones. Sarcoma may be primary or secondary and tends to remain more localized and to grow more slowly than carcinoma. Secondary sarcoma spreads rapidly. Sarcoma may pass into the vertebral canal without invading the spine.

In extramedullary cases, root symptoms are followed by signs of involvement of the same side of the cord and later by involvement of the other side; definite segmental loss is typical; extension of the symptoms upward is almost unknown. Cord-pressure symptoms are progressive; dissociation sensory loss may occur; remote loss is more segmental.

In syringomyelia the symptoms are usually referred to the lumbar or cervical regions, but occasion-

ally to the bulbar. Local symptoms precede the onset of cord symptoms, but the sensory loss is different from that due to a posterior root lesion. Trophic disturbances are severe and may appear early. The Brown-Séquard syndrome is rare. Definite segmental loss is unusual, but upward extension of the symptoms is common. Cord-compression symptoms are frequently remittent. Dissociation sensory loss may occur.

WALTER C. BURKET, M.D.

Adson, A. W., and Ott, W. O.: The Results of the Removal of Tumors of the Spinal Cord *Arch. Neurol. & Psychiat.*, 1922, viii, 520.

The results following the surgical treatment of spinal cord tumors depend upon the duration of the symptoms and the position, level, and type of the tumor. While the histories of patients with spinal cord tumors are not always constant, they are suggestive and give the first clew to the presence of such a lesion. Sensory disturbance is usually the first symptom. This is associated with motor disturbance and followed later by exaggerated reflexes below the cord segment involved.

The first operation for the removal of a tumor of the spinal cord was performed by Horsley about thirty-five years ago. Since then, many such tumors have been removed, but many have also been overlooked. The rate of progress of the disease depends on the position and type of the tumor. Intramedullary neoplasms usually progress slowly. Hard encapsulated tumors cause considerable pressure and marked paralysis in a few months. Tumors of the cord may occur in any part of the spinal canal; their average incidence is highest in the thoracic region, next highest in the cervicodorsal, and lowest in the dorsolumbar region. While spinal puncture is of value in the diagnosis, extramedullary tumors cannot be distinguished thereby from intramedullary tumors.

A review of the records of the Mayo Clinic shows that 112 patients were operated on for spinal cord tumor from January, 1910, to April, 1922. Sixty-four were males and forty-eight were females. Ninety-seven of the operations in this series were performed from 1916 to 1922, and in seventy-six instances neoplasms were found. For detailed study the diseases in the series were divided into nine groups: (1) extradural tumor, 14; (2) intradural but extramedullary tumor, 30; (3) intramedullary tumor, 31; (4) chronic meningomyelitis, 27; (5) angioma of the spinal cord (varicose veins), 3; (6) echinococcus cyst, 1; (7) tuberculoma of the cord, 2; (8) gumma of the cord, 2; and (9) cerebellospinal cord tumor, 2. In four of the cases of chronic meningomyelitis a tumor was found at autopsy.

The average duration of symptoms was twenty-eight months in Group 1; forty-five months in Group 2; forty-five months in Group 3; and forty months in Group 4. The other groups are so small that a definite average was not obtained.

Root pain was present in eight cases (57 per cent) of Group 1; in twenty (66 per cent) of Group 2; in twenty-two (71 per cent) of Group 3; and in thirteen (54 per cent) of Group 4. In Groups 5, 6, 7, 8, and 9 there were four cases of root pain (44 per cent).

In fifty-nine cases the tumor was in the dorsal region, occasionally extending into the cervical and the lumbar areas. In eighteen cases it was in the cervical region, in nine in the lumbar region, and in three in the sacral region. In twenty-three no tumor was found, the symptoms being due to an inflammatory process.

In a series of 112 laminectomies, tumors were removed in eighty-five (76 per cent). Forty-three of the tumors (51 per cent) were removed completely, twenty-six (30 per cent) were removed partially, and sixteen were not removed. In twenty-seven cases no tumor could be found at operation; in four of these, tumors were demonstrated later. Seventy-nine patients are living; twenty-two are perfectly well and at work; seven are improved and able to do a little work; twenty-one are improved but not at work; and fourteen are helpless. Fifteen patients could not be traced. Seventeen died in the hospital, and seventeen died subsequently at home. The average time between operation and death was two years.

SURGERY OF THE NERVOUS SYSTEM

Lewis, D., and Miller, E. M.: Peripheral Nerve Injuries Associated with Fractures. *Ann. Surg.*, 1922, lxxvi, 528.

Nerve injuries are associated with fractures much more frequently than is generally supposed. They are overlooked because of hasty and incomplete examination of the fracture.

The injury varies from the slightest contusion from which the patient rapidly recovers to anatomical division and callus inclusion which demand surgical interference.

It is often impossible to differentiate even between physiological interruption of the nerve current and anatomical division of the nerve by the most careful neurological examination, and there is a tendency to wait too long for spontaneous recovery.

When recovery has not begun within three months after the injury, the injured nerve should be explored and any necessary operation performed.

Neurolysis is the operation which is most frequently required. Resection of the humerus should no longer be done to permit end-to-end suture of the musculospiral nerve. In such cases tendon transplantation should be performed.

The prognosis of injuries of the musculospiral nerve is very favorable.

In the late ulnar nerve palsies with cubitus valgus transposition of the nerve to the front of the elbow

is indicated. When bony outgrowths cause paralysis, their removal and the placing of the nerve in a healthy bed may be sufficient.

H. A. McKnight, M.D.

Ott, W. O.: Experimental Results of Cable Grafts and Tubes of Fascia Lata in the Repair of the Peripheral Nerve Defects. *Minnesota Med.*, 1922, v. 5[illegible].

Experiments were conducted for the purpose of comparing the rapidity and completeness of regeneration obtained by two methods of bridging defects in peripheral nerves, the use of cable grafts and the use of fascial tube grafts. The results were compared also with those obtained by end-to-end suture. Twenty-six experiments were conducted, including four controls with end-to-end suture. In eleven experiments a cable graft of an autogenous sensory nerve was employed, and in eleven others a tube of autogenous fascia lata. The length of the gap bridged by the cable grafts and the tubes of fascia lata was the same.

The operations were performed on dogs under ether anæsthesia and with sterile technique. The sciatic and musculospiral nerves were used. In the control experiments of resection and suture the nerve was exposed and sectioned with a sharp scalpel and immediately sutured with fine silk. In the experiments with cable grafts the nerve was exposed, a 4-cm. portion resected, and an autogenous cable graft of several strands of the superficial radial or the internal cutaneous nerve or both was inserted. The size of the graft was never less than three-fourths that of the nerve into which it was introduced. Very fine silk, one third of a strand of No. 0 Japanese silk on a No. 12 cambric needle, was used. Usually two sutures were placed at each end of each strand in order that the funiculi of the graft might accurately approximate those of the nerve into which the graft was inserted. In fascial tubulization the method described by Kirk and Lewis was followed. The smooth side of the fascia lata taken from the same dog was placed within to form the lining of the tube. The bore of the tube was made twice that of the nerve repaired.

The animals were examined often, the time of the disappearance of paralysis, the healing of ulcers, atrophy of muscles, etc. being noted. Animals with infected wounds were discarded, necropsy was performed soon after death on those that died from causes not affecting the conditions of the experiment. Those that lived until the termination of the experiment were killed under ether. The animals were etherized, the muscles supplied by the nerve experimented on were exposed by reflecting the skin, and the degree of atrophy, muscle tonus, color, power of voluntary motion, and response to electrical and mechanical stimuli were noted. The nerve proximal and distal to the graft, as well as the graft, was dissected free, the nerve was cut 2.5 to 5 cm. proximal to the graft, and mechanical, galvanic, and faradic stimulation was applied to the cut end of the distal segment. After these examinations had been completed the animals were killed with ether and the nerves removed for microscopic study.

Of interest in the four control experiments in which resection and suture were done were: (1) the absence of adhesions around the suture line, (2) the normal appearance of the animals after from four to six months and the healed condition of the ulcers, (3) the absence of muscular atrophy, (4) the normal response to pinching and electrical stimulation applied to the isolated nerve proximal to the suture line, and (5) the normal microscopic picture of the nerve distal to the suture line.

In the eleven experiments in which gaps were bridged with cable grafts the animals progressed well, but not so well as those in the control experiments with end-to-end suture. The ulcers healed, the paralysis disappeared, and the animals apparently became normal after from eight to ten months. In seven instances the estimated return of function after three hundred and thirty-four days or longer was 70 to 85 per cent. Proximal neuromata were present in all cases, but were smaller than in experiments with fascial tubes. Adhesions to the graft were thin and fewer than in the experiments with fascial tubes. Fibrous tissue in the graft was not seen microscopically; the spaces between the funiculi were filled largely with loose areolar tissue.

In the eleven experiments with fascial tubulization all the animals remained paralyzed and the ulcers were unhealed at death. In two instances in which the animals lived more than three hundred and thirty-four days the estimated return of function was 25 and 10 per cent respectively. The proximal neuroma was very large in every case; adhesions to the graft were dense and firm, and the graft could be separated from the surrounding tissues only with difficulty. Large amounts of fibrous tissue were seen microscopically along the graft; in most of the old cases as much as 75 per cent of the area of a cross section was made up of fibrous tissue.

In the author's experiments with fascial tubulization it appeared that at a late stage the fibrous tissue which had proliferated inside the fascial tube and the fascial transplant contracted and strangulated the enclosed nerve fibers, thus preventing the complete return of function in the nerve. This process explains the failure of fascial tubulization clinically, and may prevent the return of function when cable grafts are used, especially if the graft is placed in a bed of scar tissue.

The conclusions drawn are as follows:

Experimentally, autogenous cable grafts over a gap of 4 cm. result in satisfactory return of function, they require a longer time than end-to-end suture, and the return of function is not so complete.

Tubes of autogenous fascia lata used to bridge gaps of 4 cm. result in delayed and incomplete return of function, if any at all.

Regeneration takes place through the fascial tubes. At first the nerve elements are abundant, but later they are largely replaced by fibrous tissue.

McGuire, E. R., and Burden, J. F.: An Unusual Case of Sarcoma of the Median Nerve. *Surg., Gynec. & Obst.*, 1922, xxxv, 453.

The patient was a woman aged 40 years who had been perfectly well until five years previously when she noticed a swelling on the anterior surface of the right forearm, midway between the wrist and the elbow. This swelling was not painful or tender. Five weeks before admission to the hospital, the arm began to swell in the region of the tumor, this swelling continuing until the arm was half again as large as the left arm and severe pain developed.

Operation disclosed a mass 8 in. in diameter involving the median nerve. The nerve was divided at either end of the tumor and removed. The resulting gap measured more than 9 in.

The tumor was diagnosed on microscopic examination as a rapidly growing, irregular, spindle-cell sarcoma originating in a neurofibroma.

Five weeks after the primary operation the patient returned with another swelling at the site of operation. An incision was made for diagnosis and another sarcoma found.

After extensive X-ray treatment it was necessary to amputate the arm. The second tumor was also a spindle-cell sarcoma. H. A. McKnight, M.D.

Linell, E. A.: On Solitary Fibromyxomata of Peripheral Nerve Trunks, with a Description of a Case of Cystic Fibromyxoma of the Median Nerve. *Brit. J. Surg.*, 1922, x, 202.

The patient was a woman 42 years of age who had a lump in the right arm which had been growing gradually for four years. When first noticed, the growth was the size of a hazel-nut but at the time it was seen by the author it was as large as a pigeon's egg. The only symptom was occasional shooting pain from the site of the tumor down into the middle finger.

Examination revealed a well-defined, painless, fusiform swelling on the antero-internal aspect of the upper arm slightly above the internal condyle of the humerus. The tumor was freely movable laterally, but not in the long axis of the limb. It was unattached to the skin, and elastic to the touch, but fluctuation was not demonstrated. Its essential connection with the median nerve was not considered on account of the complete absence of motor and sensory symptoms. From its proximity to the line of the nerve it seemed reasonable to ascribe the shooting pains in the median area to pressure. A diagnosis of soft fibroma arising from the deep fascia was made.

At operation, November 21, 1921, the tumor was removed. Both resected ends of the nerve appeared quite normal. End-to-end anastomosis was done with the elbow flexed, and the arm then maintained in this position.

At the time this report was written sensation was beginning to return but there was as yet no evidence of motor recovery.

The author discusses the histology of the tumor and shows six photomicrographs of various areas.

A brief historical survey of solitary fibromyxomata of peripheral nerve trunks is given.

The conclusions drawn are as follows:

1. A hæmorrhagic cyst of spontaneous origin arising in a peripheral nerve may be benign.

2. In the absence of more definite evidence of sarcoma, such as infiltration of the nerve above and below the lesion or adherence to surrounding structures, it would have been advisable in the case reported merely to puncture the cyst and remove as much as possible of its wall without interfering with the continuity of the nerve bundles, thus avoiding the risk of incomplete regeneration after resection and end-to-end suture.

Carl R. Steinke, M.D.

Gomoin, V.: The Surgery of the Sympathetic Nerve (Sympathicus Chirurgie). *Spitalul*, 1921, xli, 54.

Gomoin briefly describes the very poorly known physiology and pathology of the sympathetic nerve and the cervical sympathectomy first done by Jaboulay in 1896 which was later applied with different results by Jonnescu as total and bilateral resection of the cervical sympathetic in Basedow's disease, epilepsy, and glaucoma.

Gomoin states that the surgery of the sympathetic nerve ought to be better known in Roumania as the cervicothoracic sympathectomy also was done first by Jonnescu and himself (both Roumanians) in the year 1916. The patient, who had angina pectoris, has remained well up to the present time. The abdominal sympathectomy was done by Jaboulay in 1897 and later by Leriche and Heresen. Gomoin, in the year 1914, was the first to extirpate the semilunar ganglia, an operation he called "solarectomy" and applied successfully to the treatment of tabetic crises. The sacral sympathectomy has been practiced with varying results by Jonnescu since 1914 in vaginismus, sciatica, lightning pains, and tabes, and was applied with the best result by Gomoin for the relief of pelvic pain due to inoperable cancer of the uterus. Stoianoff (Z.).

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Kirch, E.: Observations on Cystic Xanthomatous Tumors and the Genesis of Xanthomatous Tumors in General (Ueber cystische xanthomatöse Geschwülste und die Genese der xanthomatösen Geschwülste im allgemeinen). *Beitr. z. path. Anat. u. z. allg. Path.*, 1922, lxx, 75.

The author has observed two interesting cases of xanthomatous blastoma, one that of a man 30 years old and the other that of a woman 27 years old. In the first case the tumor, which was the size of a goose egg, developed on the medial aspect of the right knee. In the second case the neoplasm was a fungous growth, the size of a hen's egg, on the outside of the left knee.

Both tumors had a cystic character. Their xanthomatous nature was evident macroscopically, from the peculiar sulphur-yellow and rust-brown marbled appearance of the sections. Histologic study revealed a structure consisting of two elements, one sarcomatous and the other lymphangiomatous, the latter leading to the formation of cysts. The foam cells characteristic of xanthoma had their origin in the lymphoid endothelium.

In the first case a considerable increase of the cholesterin content of the blood was demonstrable. Unfortunately a similar test was impossible in the second case. As a disturbance of the cholesterin metabolism is always present in cases of xanthomatous blastoma, the author believes that under favorable conditions in preexisting tumors, such as the lymph stasis in the lymphangioma in both of his cases, a xanthomatous transformation of certain kinds of cells occurs as the result of the deposit of cholesterin fatty acid esters, and that thereby blastomata may be transformed secondarily to xanthomatous tumors. LEMKE (Z).

Shaw-Mackenzie, J. A.: A Study in the Diagnosis of Cancer by Means of Serum Reactions. *Lancet*, 1922, ccii, 759.

This article draws attention to a new test for cancer based on a turbidity reaction in the serum. Saponified and ether extracts of cancer tissue were added respectively to the serum of patients who were suffering from cancer and the sera then incubated at 37 degrees C. for eighteen hours. They thereupon formed a permanent emulsion or precipitate, a cloud or the trace of a cloud in the serum. As a rule the ether extract was diluted with a pure sodium-chloride solution. Normal serum did not give the cloudiness mentioned.

This test is similar to that of Freund of Vienna which is based upon the observation that the isolated cells of carcinoma are dissolved by normal serum whereas the normal cells are resistant to carcinoma serum. The same is true of sarcoma. The destructive action of the normal serum on the cancer cell is attributed to its fatty acids. The latter are not present in carcinoma serum.

The test was used on 136 persons, fifty-eight of whom were normal. Only two positive reports were not confirmed; one was a case of diabetes and the other a case of neurosis. P. W. SWEET, M.D.

SERA, VACCINES, AND FERMENTS

Chiari, O. M., and Gamper, E.: The Galvanic Excitability of Motor Nerves Following the Parenteral Injection of Heterogeneous Serum (Ueber das Verhalten der galvanischen Erregbarkeit der motorischen Nerven nach parenteraler Einverleibung artfremden Serums). *Deutsche Ztschr. f. Chir.*, 1922, clxxii, 265.

In a number of cases a pronounced sickness followed a single subcutaneous injection of serum equivalent to 10 c.cm. of tetanus antitoxin, and there was also an abnormal condition of excitability in various muscle groups in the form of tonic-clonic contractions. The course of the three cases in which these symptoms were most marked is reported.

In the first case the facial expression and trismus suggested tetanus, but ruling out this condition was the fact that the trismus appeared simultaneously with the serum exanthem and the fact that the symptoms disappeared without remedial measures. In the second case there was the possibility that the patient had had a local tetanus a few years previously following an injury and that after a second injury he developed an exactly similar condition after an injection of serum as he did when treated by the author. The third patient developed a marked swelling of the arm after the injection and became unable to separate the jaw normally; this patient had also been given horse serum.

These observations led to a re-examination of a number of other patients who were given prophylactic injections of tetanus serum. Reactions as marked as those in the three cases described were not seen, probably because the sera used subsequently were somewhat stale and therefore had partly lost their anaphylactic effect.

The other examinations included the testing of the galvanic excitability of muscle (the determination of the threshold value of the cathode closure contraction) on percutaneous stimulation of the nerves, and the observation of Chvostek's facial nerve phenomenon and of the ulnar and peroneal nerve phenomena. After the first injection of tetanus serum and after re-injection, the galvanic excitability and frequently also the mechanical excitability of the muscles was increased. The intensity and the duration of this hyperexcitability are subject to variations. Occasionally the condition is demonstrable only transiently. In general it seems to be proportional to the other symptoms of serum disease, but it appears

also as the only symptom of the reaction of the organism to the injection of serum.

The behavior of the threshold values of the galvanic excitability is very constant, viz., a rapid sinking following the injection of the serum and a gradual increase, protracted over a number of days, to the average value. The parenteral injection of heterogeneous serum is considered to be the cause of this change in the galvanic excitability. The other disturbances observed after the injection of serum are easily correlated with the recognized anaphylactic reaction to which the described increase in the galvanic excitability of nerves must be added as a new symptom of serum disease. It may possibly explain also the aggravation of the condition of patients with tetanus which often occurs immediately after the injection of the serum. GUZMANN (Z).

BLOOD

Cosăcescu, A.: A Simple Procedure for Testing the Circulation in Gangrene of the Extremities (Ein einfaches Verfahren zur Pruefung der Zirkulation (vaso-motorischer Strich) bei Gangraen der Extremitaeten). *Spitalul*, 1921, xli, 384.

The question whether or not amputation should be done in gangrene of the extremities is often very difficult to answer. In 1907 Moscovicz introduced oscillometry as a method of ascertaining the condition of the circulation. In spite of the value of this procedure, however, it was necessary to seek for another, as it is very painful and in some instances appears to make the circulatory condition worse. The author has tried out the following procedure, which he designates as "the test with the vasomotor streak."

With the patient standing up or lying down a continuous line is traced from the proximal to the distal end of the affected extremity with a blunt instrument. After a brief period of pallor in this line the well-known red vasomotor streak appears. If the limb is normal, the streak appears quickly and the coloring is bright and of the same intensity throughout. If the red streak stops suddenly at any point, there is no circulation below that point.

If this test is made on the four sides of the extremity, it gives an exact circular demarcation of the tissue which is well supplied with blood from that which is poorly supplied. Amputation at the limits indicated by the test almost always resulted in primary healing; in no case was re-amputation necessary.

The author suggests that this procedure might be of value in indicating the site of an embolus.

WOHLGEMUTH (Z).

BLOOD AND LYMPH VESSELS

Morosoff, S. D.: The Conservative Treatment of False Aneurisms (Zur konservativen Behandlung der falschen Aneurysmen). *Wojenno Medizinskij Jurnal 9 Armii*, 1922, Nos. 2–3, 9.

The author has devised an apparatus for automatic pad pressure which is applied over the injured vessel (femoral artery) above the false aneurism. In one case it was possible to decrease the size of a fresh traumatic aneurism in Hunter's canal by daily pressure for from six to eight hours. PETROW (Z).

Sencert, L., and Blum, P.: A Case of Arteriotomy for Embolism of the Axillary Artery Followed by Complete and Definite Recovery (Un cas d'artériotomie pour obstruction embolique de l'axillaire suivie de guérison complète et définitive). *Bull. Acad. de méd.*, Par., 1922, lxxxviii, 84.

From a study of all reported cases of operative clearance of embolized arteries Lejaro in 1911 concluded that this treatment is of little value. Soon thereafter Mosny and Dumont reported the first case of embolectomy followed by complete success. Sencert and Blum in this article report a second similar case.

The patient was a man aged 58 years whose right arm was completely immobile, paralyzed, and without the least sensation. The condition was diagnosed as embolism of the axillary artery with complete obliteration of the vessel. An arteriotomy with resection of the embolus was decided upon. The artery was opened in the subclavicular region after section of the pectoral muscles. On dissection of the vessels several collaterals in the vicinity were found enormously distended. The embolus was near the inferior scapular artery at the base of the axilla. The axillary artery was ligated above and below the embolus. An incision about 1½ cm. long was then made in the vessel over the embolus but no blood escaped, the lumen being completely occluded by a clot. The clot removed was 4 cm. in length.

When the ligatures were loosened there was still no flow of blood. The incision was therefore extended upward. A second clot, or rather another part of the first one, was then found. This also was extracted through the wound. It was of the same size as the first portion. Immediately following its removal the blood flowed abundantly in spite of the ligature traction. After careful suturing of the arterial breach the ligatures were removed. The radial pulse reappeared immediately full and strong; an hour later the cyanotic and paralyzed limb was warm and colored. For several days there were some minor Volkmann symptoms but ultimately the result was perfect and the blood pressure the same in both arms.

W. A. BRENNAN.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Kross, I.: Parabiosis and Organ Transplantation. *Surg., Gyneс. & Obst.*, 1922, xxxv, 495.

The problems in connection with tissue and organ transplantation have interested workers both in the laboratory and in the operating room. The many failures occurring in the earlier period were due to the lack of asepsis, improper technique, etc., but when all these factors are eliminated there still remains the unsurmountable obstacle presented by

the absorption of the graft. In a great many cases in which the technique was flawless and the asepsis beyond question, autotransplants of entire organs have been successful while homotransplants have failed.

From the results obtained so far it may be concluded that the graft acts as a foreign body and meets with the same treatment from the host. The theory upon which the study reported in this article was based is that a parabiotic union removes the chemicobiological differences between two animals of the same species and makes the tissues of a graft taken from one of them bear the same chemicobiological relation to the host as the host's own tissues.

Experiments were carried out on young adult rats of approximately the same age and weight. During the course of the parabiotic operation frequent fatal complications were encountered, such as intestinal obstruction, pneumonia, and undernutrition with starvation of one of the pair. Ten days after the parabiotic operation the graft itself was transplanted. Half of one lobe of the thyroid gland was excised and inserted into a muscle pocket in the anterior abdominal wall of the other animal. This pocket was carefully prepared prior to the excision of the thyroid in order to reduce to a minimum any possible injury to the latter by drying or too much handling. The pocket was then closed in two layers, muscle and skin. Closure of the neck wound completed the operation.

Forty-four pairs of animals were used in the experiments. Of these, three pairs died before transplantation of the thyroid tissue, five pairs were lost, and seven pairs were decomposed to such an extent that histologic findings were worthless. This left thirty-two pairs for study. Of this number twelve pairs showed absolutely no trace of the implanted tissue.

Two series of autografts and homografts were made, and sections of the thyroids from the parabiotic animals were studied with these. With the exception of the graft in one pair, all the grafts showed marked lymphocytic infiltration with very little apparently normal thyroid substance remaining. Therefore the parabiosis did not neutralize the chemicobiological differences; if anything, it seemed to make them more intense.

As the result of his experiments Kross concludes that parabiosis does not inhibit those unknown agencies which, in so many instances, interfere with the success of homografts of highly developed organs such as the thyroid. GEORGE E. BRILEY, M.D.

Meyer, J., and Ivy, A. C.: Studies on Gastric and Duodenal Ulcer: The Relation of Epigastric Hernia to Gastric Ulcer—a Clinical and Experimental Study. *J. Lab. & Clin. Med.*, 1922, viii, 33.

The authors' interest in the relation of epigastric hernia to gastric ulcer was first aroused by the case of a man 22 years of age who complained of pain in the epigastrium, belching, and constipation occurring regularly two hours after meals. This patient was kept under observation for some time and also given the ulcer treatment recommended by Sippy, but at the end of six weeks no improvement was noted. An operation to correct the hernia revealed a small globular mass of preperitoneal fat continuous with the omentum which protruded through a small defect in the linea alba and was adherent to the parietal peritoneum. Gross inspection of the stomach showed no evidence of ulcer. The appendix, which was also removed, was normal. Two years have elapsed since the operation and the patient is still free from symptoms.

In their experiments the authors employed fourteen dogs. In each animal an epigastric hernia was produced. During the course of the experiments the occurrence of a pocket formation in the wall of the stomach was noted. This, the authors suggest, might be regarded as an area of lessened resistance and a potential site of ulcer. In man it would be of greater importance because of his upright position and therefore in man might lead to the formation of an ulcer more readily than in the dog. Gastric ulcer is very infrequent in dogs and it is difficult to produce a chronic ulcer in a normal dog experimentally. The pocket formation described has either never occurred in man or has never been reported.

The authors prefer to believe that the association of epigastric hernia and gastric ulcer is merely accidental. The incidence of such an association (13 per cent) they explain by the supposition that cases of this kind are reported because of their interest whereas cases of epigastric hernia without proved ulcer are not reported because they are relatively common.

The character of the distress in the experiments was particularly interesting because a gastric ulcer was not present. The pain was almost identical with that of gastric ulcer, being dull, gnawing and intermittent. It occurred in the epigastrium one or two hours after meals, and was relieved by soda and food. One investigator ascribes the genesis of this pain to the tension exerted on the herniated omentum by the vigorous contractions of the stomach which occur intermittently. The authors concur in this opinion and believe that it is supported by the fact that alkalies relieve both types of pain, the pain of gastric ulcer and that of epigastric hernia with omentocele, inhibiting the vigorous tonic contractions. These contractions begin one to two hours after meals, continue until the stomach is empty, and then disappear until a hunger period ensues. The theory mentioned is further supported by the fact that coarse food excites and increases the pain in cases of epigastric hernia.

In making a summary of their work the authors state that they are unable to demonstrate experimentally in dogs that epigastric hernia with omentocele is a causative factor of gastric ulcer. They suggest that the tendency to local pocket formation in the wall of the stomach brought about by the

tugging of the omentocele may be an etiological factor of gastric ulcer in man. They believe that the association of gastric ulcer and epigastric hernia in man is accidental, the hernia having no direct etiological relationship to the ulcer. Epigastric hernia does not cause hyperacidity; the gastric findings in such cases are within the normal variation. In cases of epigastric hernia with gastric symptoms operation is indicated definitely.

GEORGE E. BEILBY, M.D.

ROENTGENOLOGY AND RADIUM THERAPY

Kirklin, B. R.: The Roentgenological Study of the Pathologic Gall-Bladder. *Am. J. Roentgenol.*, 1922, n.s. ix, 713.

A large number of gall-stones cast no shadow in the roentgenogram, not even as much as the bile in which they are contained. George has called attention to the fact, however, that while a single stone may not cast a shadow, several stones have a density which, with the changes in the gall-bladder wall, produces a characteristic shadow easily recognized when a reasonably good technique is used.

The normal healthy gall-bladder is not visual in the roentgenogram. Therefore when it can be recognized definitely it is pathologic, i.e., it is enlarged, its walls are thickened, the bile is darker in color (which means increased density), or there are stones in the gall-bladder or ducts. When a good X-ray technique is used any of these conditions will cast a fairly dense and easily recognized shadow.

To obtain additional evidence of gall-bladder pathology such indirect evidence as may be obtained with an opaque meal may serve to corroborate the direct findings, or in the absence of the latter may give information of a nature to aid greatly in the diagnosis. In some cases the gall-bladder may cause pressure upon the duodenum or the antrum of the stomach, displace the jejunum and the colon, or cause deformity of the first portion of the duodenum by adhesions, hepatofixation of the stomach due to pericholecystitis with adhesions, or deformities of the hepatic flexure. The emptying time of the stomach following a barium meal is usually much shortened when the gall-bladder is diseased.

The technique of the X-ray examination of the gall-bladder is as follows:

The patient is instructed to take 2 dr. of compound licorice powder each night for two or three nights previously, and to eat no evening meal the day before and no breakfast on the morning of the examination. From two to four exposures of the gall-bladder region (including all the area between the crest of the ilium and the tenth rib) are first made, the penetration, time, etc., being varied but care being taken that the dark-room assistant develops all the films for the same length of time so that they will be of different densities. A barium meal is then given in the fluoroscopic room and careful search made for indirect signs. Other gall-bladder exposures are made to discover any adhesions, pressure involving the stomach and duodenum, or other findings which might have been missed in the first series of films. The hepatic flexure of the colon is studied at eighteen to twenty-four hours.

During the past twenty-eight months a complete roentgenological gall-bladder study of 712 patients was made. Roentgen-ray evidence of gall-bladder pathology with or without stones was reported in 251 cases, approximately 35 per cent. The operative findings in 214 of these cases were also studied. The surgeons reported that the gall-bladder was normal to palpation in seven of the cases in which positive roentgenological findings had been reported and pathological in six of those in which negative roentgenological findings were reported. In other words, the roentgen-ray conclusions were confirmed in all but fourteen cases, or in approximately 93.5 per cent.

The author's experience leads him to the conclusion that a careful roentgenological investigation of the gall-bladder region should be made in every case referred for abdominal study.

ADOLPH HARTUNG, M.D.

Lain, E. S.: Treatment of Cancer of the Lip by Radiation. *Arch. Dermat. & Syph.*, 1922, vi, 434.

This is a brief presentation of the results in 248 consecutive cases of cancer of the lip treated by the author with the roentgen ray and radium in his private practice between 1909 and 1921. The diagnosis was made largely from a clinical rather than a biopsy examination. Most of the cases were of the prickle- or squamous-cell variety.

Since about 1915 these cases have been classified into three groups, according to the location of the lesion upon the lip and the degree of its development which largely indicate the prognosis.

Group 1 comprises those lesions which are situated wholly on the cutaneous border of the lip, are not deeply indurated, and are without palpable or other evidence of metastasis in adjacent glands.

Group 2 consists of those in which the lesion most commonly overlaps the mucosa of the lip and is deeply indurated, and the adjacent submental or submaxillary glands are palpable. This group includes also a few cases of recurrence following previous treatment by the application of caustics or surgery. In Group 3 are cases of obvious metastasis in more than immediately adjacent glands. Approximately this entire group is composed of patients who have tried repeatedly other methods of treatment and whose condition is hopeless so far as a final cure is concerned.

In the treatment no invariable routine was followed except as regards certain proved or unquestioned procedures. One of the latter was the radiation of the submental and submaxillary glands with hard or gamma rays in all cases of cancer of the lower lip. The treatment of metastasizing areas was given in most cases by the roentgen ray with a milliamperage of from 3 to 5, a spark gap of from 6 to 10 in., an anode distance of from 8 to 18 in., and

filters of from 1 to 4 mm. of aluminum. Later, from 0.25 to 0.5 mm. of copper was added and the radiation was given for from twenty minutes to one hour at each position. During the past two or three years, the glands have been given a dosage of 180 kv., 5 ma., at a focal distance of from 16 to 18 in. for twenty-five to forty-five minutes, this treatment being repeated as indicated in six weeks.

The author is fully convinced that two or three properly timed and filtered doses of radium at intervals of a few days are more destructive to any type of cancer cell than the total given at a single exposure. The so-called fractional dosage, with either the roentgen ray or radium, is much to be feared, although it is more successful if a nearly lethal instead of a stimulating dose for the pathologic cell is given each time. The destruction of a certain class of early basal-cell cancers situated externally on the lips or elsewhere may be more rapidly accomplished, and without an objectionable scar, by the use of the combined hard beta and gamma rays than with the gamma rays alone.

The technique used in a certain type of case of Group 1, in which there was a proliferating keratotic elevation with only a mild degree of infiltration, consisted, first, in the application of a 10- or 20-mgm. plaque screened with 0.10 mm. of aluminum for a period of two or three hours. After ten or fifteen days this caused a reaction which was followed after twenty or thirty days by degeneration and perhaps an exfoliation of all superficial pathologic cells. Before this reaction began or immediately after the first application, a plaque of from 10 to 20 mgm. was applied with screening of 0.3 mm. of brass for eight to twelve hours. This filter permitted only about 5 per cent of the hardest beta rays to pass and yet utilized all the gamma rays for deeper effects. The deeper effects, which were produced in from four to six weeks, consisted in a perceptible softening and possibly complete disintegration of the deep cellular structures of cancerous nature.

In the treatment of Group 2, lesions of deeper and more extensive development, or of the squamous- or the prickle-cell variety, a 10- or 20-mgm. plaque of radium screened with 0.3 mm. of brass was first applied over the lesion for from ten to fourteen hours and then reinforced within a few days by a pack of from 100 to 160 mgm. of radium screened with 2 mm. of brass and placed on a pad of gauze from 1 to 3 cm. in thickness. This pack was placed over regions of possible metastasis for a total of from fifteen to twenty hours and the application was repeated within a few days until a total of from 2,000 to 3,000 mgm.-hrs. had been given.

In a certain class of indurated or deeply nodular cancers of the lips the application of the plaques was followed by the insertion of as many radium needles from 1 to 4 cm. apart as were necessary thoroughly to radiate the entire area of the cancerous growth. These were left for from three to five hours.

In the treated cases which belonged to Group 1, the percentage of cures was 98+. In Group 2 it is noted that since the use of the more recent and much improved methods of radiation with a heavy kilo-voltage and radium packs or when radium needles are inserted into the glandular metastasis the percentage of cures falls not far short of that in Group 1.

The author draws the following conclusions:

The cellular morphology of cancer of the lip has less importance in the prognosis than the location or degree of the development or the age of the patient. A prickle- or squamous-cell cancer in the early stage of its growth will undergo degenerative changes under radium or roentgen-ray radiation just as does the basal-cell variety, differing only in the amount of radiation necessary and the technique of its application. Statistics verified by both clinical and laboratory findings now justify the conclusion that cancer of the lip is perhaps more amenable to treatment by the roentgen ray or radium than by surgery, and in most cases radiotherapy is to be preferred.

ADOLPH HARTUNG, M.D.

Pfahler, G. E.: Cancer of the Lip Treated by Electrocoagulation and Radiation. *Arch. Dermat. & Syph.*, 1922, vi, 428.

In the latest stages of cancer of the lip neither radiation nor electrocoagulation nor any other form of treatment can be expected to cure. For successful results, cancer of the lip must be treated early and thoroughly. Thorough treatment means radiation, whatever other method is used in addition. As a prophylactic measure, every point of irritation affecting the lip should be removed. If thorough treatment is given in the early stages, practically all cases will be cured.

The author has treated 105 cases of cancer of the lip in his private clinic. Eighty of them were primary; twenty, recurrent; and five, postoperative. Of the eighty patients with primary lip cancer, seventy-four recovered and have remained well from several months to eighteen years. Two died of a continuation of the disease, and two have had a recurrence. The result in two other cases is unknown. Of the twenty patients with recurrent cancer of the lip, only eight recovered. The five patients given postoperative treatment have remained well, though none was subjected to a block dissection.

Much depends on the promptness and thoroughness with which these patients are treated, but in part at least the outcome depends also on the nature of the cancer and the degree of its malignancy. The effect of radiation must be prompt or failure is apt to result. Thorough radiation by means of the roentgen rays from the very beginning, and by radium when it can be combined to advantage, is most important.

Selection of cases is necessary to determine whether radiation should be combined with electrocoagulation. If the lesion is small and its removal will not cause too serious a defect in the lip, destruction by electrocoagulation will be followed by

more prompt and more satisfactory results than radiation alone. By such destruction the diseased tissue is macroscopically removed in much the same manner as the surgeon removes it with the knife, but the blood vessels and lymph channels are not opened. If the cancer involves the entire lip, or even half of the lip, such preliminary destruction by electrocoagulation is impractical unless some means of closing the mouth by a subsequent plastic operation can be foreseen. Generally speaking, a thorough trial should be made first with applications of radium in advanced primary cases. If radium is skillfully applied, good results may be expected. In some cases, however, only marked temporary improvement may occur, a stage being then reached in which the disease is at a standstill or begins to progress in spite of radiation. At this stage, complete and thorough local destruction or complete surgical excision is probably the only procedure possible.

Electrocoagulation consists in the coagulation of the diseased areas by means of the high-frequency current. This current is not selective in its action, and will destroy the tissues radiating outward from the point of application. It cannot be used in areas in which essential structures, such as important blood vessels or nerves, are located in the line of destruction. Beyond the actual coagulation there will be a zone which will be superheated sufficiently to destroy any cancer cells, but not sufficiently to destroy the healthy tissue. The defect after the patient is well does not nearly equal the amount of diseased tissue removed. There is, apparently, a regeneration of a part of the tissue removed. The heat is generated in the tissues. It is the penetrative value of this form of heat that makes it more desirable than that obtained by the thermocautery which destroys only by transmitted heat and therefore is essentially more superficial in its effect.

Radiation is indicated in all cancers of the lip, whatever other treatment is used, and sufficient radiation must be employed actually to destroy the cancer cells. If a patient is to be operated on surgically, a preliminary radiation with a full erythema dose should be given over the lip and chin and in the submental and submaxillary regions, and a similar radiation should be given after the operation and two and three weeks after the preliminary treatment. The patient should then be kept under observation for several years, and more radiation should be applied if there is the slightest sign of recurrence. The same type of radiation should be added to electrocoagulation and can be applied most practically by means of the roentgen rays. For this purpose the author uses a 9-in. spark gap with 5 ma. of current through 6 mm. of aluminum filter at a distance of 30 cm. for twenty-five minutes. The time must be governed by the radiation value of the instrument used.

If sufficient radium and sufficient skill in its use are available, most, and perhaps all, local cancers of the lip can be cured. This treatment will require more time, more skill, and more patience than the combination of electrocoagulation and radiation, but there will be more preservation of tissue and a better cosmetic result than can be obtained by any combination with surgery or electrocoagulation. If radium is to be used for the local destruction of the cancer with preservation of the tissue, the local tissues must be kept saturated to the limit of toleration of the normal structures until the cancer entirely disappears. The submaxillary regions can be treated by surface applications properly screened.

If metastatic nodules are palpable, they should have preliminary radiation as described and should then be dissected out or treated by the insertion of radium needles sufficient to destroy the disease. Radium needles of 10 mgm. each may be inserted 1 cm. apart throughout the diseased area and left in place for eight hours.

The author draws the following conclusions:

1. Any fissure or crust on the lip which persists longer than a month should suggest malignancy.
2. Local destruction by electrocoagulation followed by thorough radiation should effect a cure in practically all cases if it is done early.
3. Thorough radiation by radium or the roentgen rays should be given over the lymphatics draining the diseased area.
4. In cases of recurrent carcinoma the results are much less satisfactory.
5. Metastatic lymph nodes should be treated by surface radiation and then by radium implantation or excision.

ADOLPH HARTUNG, M.D.

Taussig, L.: Carcinoma of the Tongue and Its Treatment with Radium. *Arch. Dermat. & Syph.*, 1922, vi, 424.

Cancer of the tongue is seen most often between the fourth and sixth decades of life and is much more common in men than in women. It occurs most frequently on the side of the tongue. Pathologically, it is practically always of the squamous-cell type. Among the etiological factors, syphilis and trauma produced by rough teeth and the use of tobacco are of prime importance. Since it is often preceded by such conditions as leukoplakia and chronic ulcer, the prompt and thorough treatment of such lesions may prevent its occurrence. Every effort should be made to differentiate it from syphilis and tuberculosis. At times this differentiation is difficult.

Operation, which has been the accepted form of treatment, is very mutilating, has carried a high mortality even in the most skilled hands, and has given few cures. During the past few years a number of physicians have treated cancer of the tongue by electrocoagulation, usually in conjunction with radiotherapy. In capable hands, these methods have frequently given satisfactory results.

The treatment of carcinoma of the tongue with radium has many advantages. In the first place, there is no primary mortality. Secondary death, due to hæmorrhage or infection, is far less common after radium treatment than after surgery. A

palliative result can be obtained in the majority of the cases with radium treatment. On the other hand, even if the patient survives operative treatment, speech is greatly impeded, the patient is able to eat only with great difficulty, and there is frequently increased rapidity of growth of the neoplasm. It is still impossible to estimate the percentage of cures obtained by radium because the method has not been in use long enough and because the majority of the cases seen are those which the surgeon considers hopeless. The great disadvantage of radium in these cases is the painful reaction. It is impossible to estimate the severity of this in advance. In some cases the period of reaction was short and the healing of the ulcer and softening of the lesion were prompt. In others, the amount of suffering was out of all proportion to the extent of the lesion and the clinical appearance of the reaction. No satisfactory method of combating the reaction has been found.

The ideal method of treating these cases consists in inserting tiny unscreened tubes of radium emanation as described and first done by Janeway and Quick of the Memorial Hospital of New York City. It is best to give the entire dose at one sitting and to seed the entire indurated area with the emanation tubes (each of which contains about 1 mc.), inserting from five to ten or more according to the size of the lesion. This gives an even, intense radiation throughout the tumor mass. In addition, crossfire from the surface by means of a radium plaque or the application of a number of tubes is sometimes used. The reaction occurs a little earlier following the use of buried bare tubes of emanation than following the surface application of radium. It begins as a rule in about seven days, is usually at its height in from two to three weeks, and then gradually diminishes. This reaction consists of an increase in the swelling with burning pain and often an increase in the size of the lesion due to ulceration following the separation of the slough. A reaction on portions of the mouth adjacent to the area treated is a constant and often painful and unpleasant feature. In favorable cases, after the height of the reaction has been reached, the lesion softens rapidly and then heals slowly.

Probably the method next best to the burying of bare tubes of emanation is the insertion into the tumor mass of steel needles containing radium element. The number of these and the time of exposure depend on the strength of the needles and the size of the lesion. This method probably causes more tissue destruction than the bare tube method and does not give such an intense local radiation. The surface application of tubes or plaques alone is certainly the least satisfactory form of treatment and can be expected to give no more than palliative results except in the most superficial cases.

At the same time that the tongue lesion is treated the cervical glands should be given a massive dose of roentgen ray, covering three areas, the front and the two sides. If there are palpable glands that are clinically malignant, these should be removed about two weeks after radiation if they are operable. If they do not appear to be operable, bare tubes may be buried in them at the time of a partial operation or inserted through the skin under local anæsthesia. If no glands are palpable, the patient should receive two or three courses of roentgen-ray treatment and be kept under close observation as long as possible. If glands develop under treatment, they should be operated on at once and the roentgen-ray treatment continued after operation. During operation, bare tubes may be buried in any suspicious area. The technique of the roentgen-ray treatment has been constantly changed. During the last year the distance and the screening have been considerably increased, with apparently better results. The application of a radium pack to the neck in these cases has been given up as uneconomical and no more effective than the roentgen ray.

During the last two and a half years fourteen patients with carcinoma of the tongue have been treated by the author. Four were clinically free of the disease: two of them two years; one, one and a half years; and one, six months after treatment. Five showed cervical metastases at the time treatment was instituted, and five of the others developed an involvement of the glands during treatment. None of these patients survived. It is reasonable to expect that with improved technique it will be possible to cure 25 per cent of unselected cases of carcinoma of the tongue by radiation.

ADOLPH HARTUNG, M.D.

Freer, O. T.: Carcinoma of the Larynx Treated Locally with Radium Emanations: A Clinical Report. *J. Am. M. Ass.*, 1922, lxxix, 1602.

By means of an apparatus which he described in detail the author has been able to apply radium treatment to a number of cases of carcinoma of the larynx most satisfactorily. After the induction of local anæsthesia of the oropharynx, the base of the tongue, and the larynx, the specially devised holder containing four radium emanation tubes is placed as close to the growth as possible. The dose found best in the average case is from 200 to 300 mc. for one hour, repeated every three to seven days until from 600 to 750 mc. have been used. The reaction is usually moderate and the cancer disappears rapidly. Early and soft medullary carcinomata may disappear after only one treatment of 250 mc. for one hour. Irradiation up to the full dose should be given, however, even though it causes a sharp reaction.

Thirty-two cancers of the larynx were treated by intralaryngeal irradiation. Three of the patients were moribund when admitted and soon died. In twenty-two others the cancer was in an advanced stage. In only seven was it in an early stage. Four of the cancers were very resistant to irradiation. In two of these, early hopeful progress was followed by no further response to the rays; in a third there was an excessively prolonged reaction which had not

ceased when the patient died of pneumonia. In the fourth case, the cancer progressed after temporary improvement and then could be checked only temporarily.

In eleven patients, speedy, complete disappearance of the cancer and its symptoms was followed by a return of the growth, the average time between the last irradiation and the return being four and one-half months. In seven of these patients the advanced state of the cancers favored a relapse, all being large tumors deeply invading the tissues. In four of these cases of recurrence the cancer was again removed by renewed irradiation and there was no further relapse. The fifth was being successfully treated when the patient died of heart failure. These four cases, with ten in which the cancer disappeared without return after the first irradiation, make a total of fourteen in which the cancer was completely eliminated and the patient became clinically well. Deducting the three cases of moribund patients leaves fourteen of twenty-nine, or about 50 per cent, in which there was clinical recovery. This is a good percentage considering that in twenty-five of the thirty-two patients the cancer was in an advanced stage, and thirteen of the patients had extrinsic cancers, that is, cancers which were inoperable by laryngectomy.

The author's experience has led him to the conclusion that external irradiation is much too feeble to be efficacious. By virtue of its selective action, radium emanation applied in sufficient strength within the larynx offers a far greater chance of cure. The amount of reaction after irradiation varies, but only in the exceptional case is it very intense and prolonged. Renewed symptoms after apparent cure invariably mean recurrence. Recurrences usually react to re-irradiation in much the same manner as the cancer reacted to the primary irradiation.

The prognosis is best in cases of early superficial cancers on the cords or in the arytenoid region which do not impair cord motion. It is less favorable when a cord is fixed and when deep œdema of the arytenoid and ventricular band region reveals entrance of the cancer into the laryngeal muscles or perichondrium.

Scirrhous cancer with retracting distortion of the interior of the larynx but no œdema and with little visible neoplasm was found favorable for irradiation, as were also soft cancers of rapid growth, little penetration, and large tumor formation. Squamous-cell carcinomata with a white, fuzzy surface may be resistant, especially when they cause pain and deep swelling. An unfavorable symptom is intense, prolonged reaction with œdema and false membrane formation. This shows either weak resistance of the tissues to radium or multiple, deep cancer foci. Early glandular carcinosis usually yields readily to external irradiation from a distance, with from 500 to 1,000 mc. for seventeen hours, as employed by Simpson and Flesher. The outlook is unfavorable when all of one side of the neck, including the inferior triangles, is filled with gland cancers and when paralysis of the recurrent laryngeal and hypoglossal nerves is revealed by deep invasion of the neck.

The treatment of cancer of the larynx by irradiation by the method advocated contrasts very favorably with operation. By its selective destruction, it causes the cancer to vanish, leaving the normal tissues intact. It often restores speech and the normal structure of the larynx. The penetration of the rays clears away not only the cancer but also the hidden cancer foci in its surroundings which the knife cannot reach. It offers the patient about a 50 per cent chance of being freed of the cancer, either at once or by the irradiation of recurrences. Therefore emanation should be the first and laryngectomy the last resort.

ADOLPH HARTUNG, M.D.

Barringer, B. S.: Technique and Statistics in the Treatment of Carcinoma of the Bladder by Radium. *Am J. Roentgenol.*, 1922, n.s. ix, 757.

In the treatment of carcinoma of the bladder by radium the application is made intravesically to growths confined to and around the bladder neck, small papillomata, pedunculated papillary carcinoma (if the pedicle can be reached), and infiltrating sessile growths not more than 2 cm. in diameter. Growths other than these are treated by the suprapubic method. This group includes extensive infiltration of the bladder wall, large and multiple tumors, and doubtful cases.

The technique employed in the intravesical method is as follows:

By means of a flexible spring holder used through the sheath of the Brown-Buerger operative cystoscope 100 mc. or more of unscreened radium are held against the tumor for half an hour while the tumor is being observed through the cystoscope. This is repeated every two weeks or less often if the tumor is disappearing satisfactorily. If the neoplasm appears solid or hard or has an indurated base it may be treated by thrusting into its base or the indurated part a radium needle screened simply by the steel of the needle. If the tumor is more extensive, if it is papillary in character, if the pathologic examination shows it to be a pure papilloma, and especially if it is around the bladder neck, the treatment is often begun by placing in the bladder two tubes of screened radium (0.6 mm. silver, 2 mm. rubber). These tubes are inserted through the sheath of a straight cystoscope, tied with a string, left in place for varying periods of hours, and then pulled out of the urethra by the attached string. As a rule the author uses two tubes of 50 mc. for five or six hours. The value of such radiation is, first, to determine how the tumor reacts to radium; second, to stop the bleeding temporarily so that cystoscopy will be possible; third, to destroy that portion of the tumor around the internal urethral orifice.

The suprapubic application of radium in extensive carcinoma is made under gas and oxygen anæsthesia. The bladder is exposed and opened. Sponging of the exposed tumor is restricted to the minimum in order

to prevent bleeding and the spreading of tumor cells. Protruding portions of the tumor are snared off with a simple wire snare. If the tumor is flat and not papillary in type, none of it is removed. The papillary part is snared off to facilitate exposure and treatment of the base. In the indurated parts of the tumor a bare radium tube (0.7 mc.) is implanted by means of a needle in each square centimeter. These bare tubes are put in to the extreme edge of the tumor. The bladder is filled with 60 per cent alcohol after the method of Beer (three minutes) in order to kill any stray tumor cells and to prevent implantation. It is then closed with plain catgut and usually is drained with a small rubber tube.

To determine the value of radium removal of bladder carcinoma comparison is made between the results obtained with radium and those given by operative treatment. Three groups of cases are considered, viz., operable cases, inoperable cases, and those in which operation is performed as an adjunct to radium treatment. In the inoperable group are placed:

1. Multiple carcinomata or large carcinomata with a base more than 4 cm. in diameter.

2. Carcinomata which have affected the trigone and posterior urethra.

3 Carcinomata which have been operated upon previously and have recurred.

4. Carcinomata in persons whose age or condition contra-indicates operative removal.

Ten operable and twenty inoperable cases treated with radium are cited in detail as regards the gross and microscopic pathology, the complications, the method of applying the radium, and the results. In eight of ten operative cases (80 per cent) the carcinoma was removed from the bladder. The two patients who died lived two years and three months respectively after they were first seen. In twenty inoperable cases of bladder carcinoma the tumor was removed from the bladder. In three cases the carcinoma recurred after removal. In one of these three the recurrence was beyond the bladder; the other two are being treated. One patient died from radium sloughing of the bladder.

Brief consideration is given to tumors in the third group. Thirty-five bladder carcinomata were treated in this way. In only two of these cases might the tumor have been regarded as operable. In two cases it was so large that the bladder was not opened, but radium was implanted in it. In twelve of these thirty-five cases the carcinoma had been removed from the bladder. Nineteen of these thirty-five patients are living. In cases which could not be benefited, it is probable that death was not appreciably hastened. On the contrary, in some hopeless cases the tumor's growth was retarded, the span of life lengthened, and bleeding stopped.

Scholl of the Mayo Clinic reported that of ninety-four patients operated upon for solid carcinoma of the bladder, sixty-seven (71.2 per cent) are dead after an average duration of life of seven and a half months, and twenty-seven (28.7 per cent) have lived an average of three years and three months. Twenty per cent of patients operated on for infiltrating carcinoma died during the first month after the operation, while radium removal had no immediate mortality.

The following conclusions are reached:

Radium removal is superior to surgical removal because it can cope with inoperable cases. If radium removal can be effected suprapubically the time of operation is shorter and the kidneys are less disturbed by the operation. Many so-called operable tumors can be removed through the urethra without operation.

ADOLPH HARTUNG, M.D.

Burnam, C. F.: The Results of Treatment of Carcinoma of the Cervix, with Statistics and Technique. *Am J Roentgenol*, 1921, n.s. ix, 705.

Surgical removal in the very early stage of the condition has a low mortality and morbidity and results in a permanent cure in a considerable number of cases. In moderate involvement of the parametrium and vaginal walls both the mortality and morbidity are increased and the percentage of cures is decreased. In cases of extensive parametrial or vaginal wall involvement the mortality is definitely increased, the morbidity greatly increased, and the cures are very few. In cases of fixed parametrial masses and very extensive vaginal, bladder, rectal, or regional gland involvement there are practically no cures.

Local treatment with radium has no mortality or morbidity in the early cases and a very substantial percentage of permanent cures. In the extensive borderline operable cases the mortality and morbidity are low, the percentage of short clinical cures is very high, and the percentage of long clinical cures much less than in early cases, but much greater than that following operation. In cases of extensive parametrial fixation and those with involvement of contiguous parts of the bladder and rectum or all or nearly all of the vaginal wall immediate relief is given and may persist for months or years. Clinical cures are also very common, but persist for five years in only a small percentage of the cases.

Radiation from the surface of the body, the abdomen, the back, or the perineum has been employed chiefly as a method supplementing other forms of treatment. In the presence of extensive gland metastases this method sometimes resulted in marked relief from pain as well as some shrinkage of the masses, but nothing approaching a cure was ever observed. In view of the claims made regarding the results obtainable by the Erlangen method of treatment with highly penetrating roentgen rays it would be advisable to obtain statistics of cures, especially in fairly early cases, so that the relative value of this method and radium therapy could be determined.

Of 213 cases observed by the author with Kelly and reported in a previous communication only fourteen were operable. Ten of the latter were treated by a combination of radium and operation, and four by radium alone. At the time this article

was written, more than seven years after the treatment, five of those treated with operation and radium and two of those treated with radium alone are still alive.

With regard to the technique the author states that emanation has been employed for a number of years instead of radium element. Applicators are ordered and arranged to fit the requirements of the particular case. When the cancer is limited to the cervix one tube is placed at the internal os, one at the external os, and four on the cervix. In such cases a total of 3,000 mc.-hrs. of radiation (1,200 mc.-hrs. within the cervix and 1,800 mc.-hrs. upon it) is a curative single dose. When the parametrium is involved the exposure should be increased 4 or 4.5 gm.-hrs. For extensions on the vaginal wall about ¾ gm.-hrs. of irradiation evenly distributed should be given for each square 2.5 cm. of surface in addition to the cervical treatment indicated. Deep parametrial or paravaginal nodules should be treated by the implantation of emanation points. In cases of high abdominal masses this implantation should be effected through an abdominal incision. When the needles are used the treatment is given under gas anæsthesia. When needles are not used the patient is treated in the knee-chest posture without the induction of anæsthesia.

After the treatment examinations are made at intervals of two weeks and no further treatment is given for at least ten weeks unless there is obvious trouble outside of the areas treated. Retreatment in the heavily radiated areas, if necessary, must be much lighter. As a preliminary to operation, about two-thirds of the dosage mentioned is given.

The primary results of the treatment discussed was very good. A primary clinical cure was obtained almost invariably except in the advanced inoperable cases.

The following conclusions are reached:

The treatment of choice in early operable cases is operation with pre- and postoperative radiation. In late operable cases it is topical radium treatment and perhaps external radiation. In advanced cases topical radium treatment and the implantation of bare points are indicated. The use of radium alone in early operable cases is thoroughly justifiable. Operation alone is also justifiable.

ADOLPH HARTUNG, M.D.

GYNECOLOGY

UTERUS

Bretschneider: Observations on Myoma and Accident (Ueber Myom und Unfall) *Zentralbl. f. Gynaek.*, 1922, xlvi, 1275

Sarcoma and carcinoma of the uterus have never been recognized as the results of accident because in such cases the essential conditions advanced by Thiem in his "Handbook of Diseases Due to Accident" (viz., a single and considerable effect of force at the site of the subsequent tumor and the formation of the tumor at a definite time determined on the basis of experience) are not fulfilled. In a lawsuit in which the author was requested to give an expert opinion he denied the relationship between myoma of the uterus and an accident, basing his statement on Ribbert's theory of the origin of tumors. He believes that just as in cases of sarcoma and carcinoma of the uterus, so also in cases of myoma, an accident as a cause must be denied on principle.

On the other hand, a number of cases—the author has observed such a case himself—have been unquestionably demonstrated in which an accident acted unfavorably upon a myoma already present, causing hæmorrhage, necrosis, gangrene, peritonitis, or inversion of the uterus. Therefore the question whether a powerful force injures a myoma and decreases the woman's earning capacity must be answered affirmatively, but the question as to whether an existing myoma may undergo sarcomatous degeneration as the result of such trauma must be decided on the basis of the findings. MEISNER (Z).

Bonney, V.: Remarks on the Scope and Technique of Myomectomy. *Lancet*, 1922, ccii, 745.

Myomectomy fulfills a higher surgical ideal than hysteromyomectomy in that it preserves the potentiality of reproduction. The very small fibroids as well as the large must be removed. Fibroids with broad bases placed posteriorly at or near the cervix often require difficult surgical procedures.

Malignant, necrotic, and suppurative degenerations are contra indications to myomectomy.

Pedunculated and superficial tumors can be removed without disturbing an associated pregnancy, but in cases of deep fibroids the pregnancy must be interrupted at the time of operation.

A single anterior incision is best. Posteriorly placed fibroids are removed through the uterine cavity or through the wall unless they are pedunculated or superficial. Anterior incisions are more favorable because they are more accessible if postoperative bleeding or infection occurs and less liable to intestinal adhesions. Silk sutures are employed unless the uterine cavity is entered; when the uterus is opened, catgut is used.

All redundant tissue is removed in order not to leave the organ too large when the operation is finished. If hæmorrhage is troublesome all uterine arteries may be temporarily clamped during the operation. R. E. CHRISTIE, M.D.

De Ott, D.: The Evolution of Hysteromyomectomy (L'évolution de l'hystéromyomectomie) *Gynéc. et obstét.*, 1922, vi, 106.

In 1894 De Ott of Petrograd reported the results of twenty cases of supravaginal amputation of the fibromyomatous uterus with extraperitoneal fixation of the stump; the mortality was 4.3 per cent. Schroeder later simplified the treatment of the stump. In 1901 De Ott was obliged by the exigencies of a case to perform a radical vaginal operation. This resulted satisfactorily. With the perfecting of the operative technique and asepsis a series of ninety-nine cases were operated upon in this manner. There were no deaths. In a second series of 372 cases the mortality was only 0.27 per cent. When the abdominal route was used the mortality was 7.87 per cent, and in a total of 1,454 operations by both methods (high and low) performed during the period from 1895 to 1912, and a total of 1,834 operations performed up to 1921, the mortality was 3 per cent.

In Petrograd the mortality of abdominal operations for fibroma has fallen from more than 15 per cent in 1885 to about 7 per cent in 1920, and the mortality for operations by the vaginal route from about 3 per cent in 1895 to zero in 1920. These figures show that the operation of hysteromyomectomy is now satisfactory. Success is due especially to the perfection of asepsis. W. A. BRENNAN.

Frank, R. T.: Cancer in the Cervical Stump; Metastasis in the Vermiform Appendix. *Surg., Gynec. & Obst.*, 1922, xxxv, 314

The case reported was that of a woman 47 years old who had had a supravaginal hysterectomy for fibroids and five months later was treated with radium for carcinoma of the cervical stump.

One year after the hysterectomy the patient entered the hospital and shortly afterward developed symptoms of obstruction of the bowels. Surgical measures were employed but death occurred one hour after the operation.

Autopsy revealed a cancer of the cervix which had not invaded the peritoneal cavity but involved the vesicovaginal septum and the parametrium. Numerous retroperitoneal lymph glands contained metastases.

In the tip of the non-adherent vermiform appendix was a small mass which proved to be identical in morphology with the original tumor.

Because of the danger of the development of cancer in the cervix following supravaginal hysterectomy some surgeons believe that a total hysterectomy should be done in all cases, but because of its higher mortality and the fact that it does not always prevent the recurrence of cancer the author regards its routine use as unwise.

A search of the literature failed to reveal a case of metastatic carcinoma of the appendix in which continuity or contiguity were not responsible for the metastasis. I. E. Bishkow, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Bell, W. B.: Endometrioma and Endometriomyoma of the Ovary. *J. Obst. & Gynæc. Brit. Emp.*, 1922, xxix, 443.

The author reports on his investigation of the so-called "chocolate cysts" of the ovary and credits Sampson with the recognition of this very interesting pathologic and clinical condition.

From Bell's study of the subject it seems probable that all unstriped muscle fibers in relation to endometrial tissue in the ovary are merely those which are normal to the ovary but have undergone hyerplasia.

Bell reports a specimen removed by supravaginal panhysterectomy in which the uterus and tubes appeared normal but both ovaries showed endometrial tissue on section. Sections were made from the ovarian ligaments on either side at the junction of the ligament with the uterus but no trace of endometrial tissue was found. Consequently the conclusion is drawn that the lesions present were an independent ovarian endometrioma and an endometriomyoma respectively. Such cases are not uncommon and it is probable that before long many will be reported.

The article is illustrated with six figures showing the gross specimens and photomicrographs of the sections from the ovaries. C. H. Davis, M.D.

De Bruyne, F.: The Clinical Results of Ovarian Grafting (Contribution à l'étude de la greffe clinique de tissu ovarique). *Gynéc. et obstét.*, 1922, vi, 136.

The author first discusses nine cases found in the literature in which an ovarian graft was extirpated and examined histologically.

Recently he has had a similar experience in the case of a woman of 25 years who had had a hysterectomy for adnexal tumor. The graft was transplanted subcutaneously into the abdominal wall and extirpated one hundred and seventy-three days later. Histologic examination showed that it had given rise to a proliferation of luteinic tissue which formed the wall of cysts too irregular in structure to be identified with a normal corpus luteum or a true neoplasm. In the author's opinion the luteinic cells have a longer existence in the transplanted ovary than in the normal ovary. In the case reported the transplant had taken up the function of the ovary in part at least.

Earlier research demonstrated that the results of ovarian grafts are more transitory after subcutaneous transplantation than after transplantation into the abdomen or pelvis. The author's clinical experience confirms this finding.

De Bruyne has had sixty-eight cases of subtotal hysterectomy with bilateral salpingo-ovariectomy. In fifty-eight of these, fragmental ovarian grafts were implanted subcutaneously on both sides. The majority of the grafts included parts of the corpus luteum, the cortical layer, and the medullary zone.

Up to a certain point the subcutaneous transplantation of ovarian tissue, especially if the graft hypertrophies and becomes congested (which occurs in about 40 per cent of the cases), will prevent the disturbances of a premature menopause in 78 per cent of the hypertrophy cases.

A cystic formation results in 70 per cent of the cases in which the cortical layer of the ovary is grafted and in only 20 per cent of the cases in which the corpus luteum is grafted.

Cystic formations are more frequent when the ovary from which the transplanted fragment is taken shows a normal histology.

In women more than 40 years old the grafts never become hypertrophied.

Although in the author's case he did not find any clear signs of follicular maturation, the clinical findings indicated that the transplanted follicles played the principal rôle in the phenomena observed.

W. A. Brennan.

Dorland, W. A. N.: A Clinical and Embryological Report of an Extremely Early Tubal Pregnancy; Together with a Study of Decidual Reaction, Intra-Uterine and Ectopic. *Am. J. Obst. & Gynec.*, 1922, iv, 372.

The subject of ectopic decidual reaction is of too recent development and the clinical material is still too scanty to warrant any very definite conclusions. Outerbridge covered the matter satisfactorily when he stated that ectopic decidua appears, on the whole, to be extremely fitful in occurrence, a circumstance which may be ascribed to variations in the intensity of action of the ovarian hormone, different degrees of responsiveness on the part of the subperitoneal connective-tissue cells, or the presence or absence of suitable local stimuli.

According to Taussig, the superficial location of the ectopic patches seems to indicate that the end-products of the normal decidual reaction do not reach these points through the blood or lymph channels, but pass directly through the lumina of the tubes and out through the fimbriated extremities, causing a decidual reaction in the ovarian and pelvic peritoneum through irritation. This theory would seem to offer a satisfactory explanation of the comparatively great frequency of the patches in the peritoneum of the Douglas cul de sac, the posterior surface of the uterus, and the rectal walls, areas toward which the irritating material would naturally drain. E. L. Cornell, M.D.

EXTERNAL GENITALIA

Smith, R. R.: Prolapse of the Female Urethra and Eversion of the External Urethral Orifice. *Am. J. Obst. & Gynec.*, 1922, iv, 195.

Operations for the relief of prolapse of the female urethra will vary somewhat according to the findings and whether or not there are other conditions to be dealt with at the same time. A simple eversion may be corrected best by removing the protruding mucosa and narrowing the meatus by a triangular or more or less square denudation just below the orifice and including part of its circumference. This operation is apt to be bloody, and considerable care is necessary to make the denudation of proper form and sufficient extent. In closing the wound the meatus should be narrowed to its normal proportions. Smith is placing the sutures deeper than formerly in order to insure approximation for a longer period and prevent separation of the edges and a granulation wound. When considerable mucosa is removed and a circular incision of the urethra is necessary, the stitches reuniting the mucosa to the edges of the orifice should be rather deep, catching up a fair amount of mucosa, and should not be tied too tightly. The edges are apt to separate, if catheterization is long continued.

Prolapse of the vaginal wall and urethra is corrected best by removing the redundant mucosa by a triangular incision with its base across the vagina and its apex toward the meatus. The denudation should include all of the redundant mucosa or more. By bringing the edges together the operator may judge the amount which must be removed. The incision is closed with deep sutures which catch up first the edges of the mucosa, avoiding the urethra, and draw the urethra and external orifice back up under the pubes where it belongs. On the whole, the results are good, but in some cases there may be partial recurrence of the prolapse. E. L. Cornell, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Handorn, L.: Ileus During Pregnancy (Ileus in der Schwangerschaft). *Zentralbl. f. Gynæk.*, 1922, xlvi, 1057.

Intestinal obstruction is a dangerous, but fortunately a rather infrequent, complication of pregnancy and the puerperium. Usually the cause is a condition such as invagination or volvulus. Instances in which the pregnant, non-incarcerated uterus alone is the cause are very rare.

Handorn reports the case of a 42-year-old viipara in the ninth month of pregnancy who had had constipation for twenty years which became more pronounced during each pregnancy. Three days before admission to the hospital she suffered an attack of severe abdominal pain, vomiting, and eructation followed by complete retention of fæces and urine. At the time of admission the abdomen was markedly distended and distinct peristaltic movements were visible above the umbilicus. Dullness was present a hand's breadth above the symphysis. The uterus itself was not palpable and the heart sounds were inaudible. Enemas were unsuccessful.

Operation revealed marked distention of the small and large intestines. The obstruction was caused by the pregnant uterus which clamped off the colon between the flexure and rectum. A cæsarean section was done and a non-viable child delivered which died after twenty minutes. The patient recovered.

The author agrees with Fleischhauer who, in all cases of pressure of the pregnant uterus, presupposes a disturbance of motility of the intestine. In Handorn's case the existing intestinal activity was markedly increased by a dietetic error which rendered the distended, weakened gut unable longer to overcome the pressure of the uterus.

If enemas are not successful the abdomen should be opened. Vaginal cæsarean section should not be attempted before this is done as otherwise the incarcerated coils of intestine may be injured. After the abdomen has been opened the uterus should be emptied only if it is found to be the immediate cause of the obstruction or closure of the abdominal wall without emptying of the uterus would be difficult. No consideration need be given to the infant as a premature birth usually follows the operation.

In a case of intestinal obstruction occurring during the sixth month of pregnancy which was operated upon by Enderlein, the obstruction was found at the sigmoid flexure. The flexure was twisted at an angle of 180 degrees and wound around the uterus at about the level of the internal os. Enderlein unwound the intestine, resected the long injured coil, and sutured the ends of the gut into the abdominal wound. Death occurred after a few hours. In the development of the volvulus, the length of the flexure, and the lesions of the mesosigmoid were contributory factors in addition to the pregnancy.

WORTMANN (Z).

Solomons, B.: The Results of the Treatment of Eclampsia by the Dublin Method. *J. Obst. & Gynæc. Brit. Emp.*, 1922, xxix, 416.

Special points in the treatment are:

1. Starvation. In some cases nothing but water is given for several days. If then there is no improvement, cæsarean section is performed.

2. Gastric lavage. This is continued until the water returns clear. Two ounces of magnesium sulphate solution are then left in the stomach.

3. Bowel lavage. This is given with the patient on her left side and with the tube inserted 18 in. into the bowel. Sodium bicarbonate, 1 dr. to the pint, is used until the bowels are clear, and then 1 pt. of the solution is left in the bowel.

4. Morphine. Recently this has been omitted.

5. The injection of sodium bicarbonate under the breasts.

6. Close observation to prevent "drowning" or other accidents.

Of the women whose cases are reviewed, 67.15 per cent were primigravidæ. When both the mother and child recovered the average number of convulsions was 5.03. When the mother alone recovered it was 9.45; when the child alone recovered it was 9.50, and when neither recovered it was 10.20. The more frequent the convulsions the graver the prognosis.

The incidence of the condition was greatest in January, February, March, and September. The average mortality was 10.29 per cent.

R. E. CHRISTIE, M.D.

LABOR AND ITS COMPLICATIONS

Pickett, A. N.: Immediate Repair of Lacerations Versus Delay. *Kentucky M. J.*, 1922, xx, 590.

The author believes that repair of lacerations due to labor within thirty-six hours after delivery is better than intermediate repair five to ten days later, or late repair months or years later. Against the intermediate method of Hirst are the ill effects of the nerve strain experienced by the patient when it is necessary for her to submit to another operation so soon, the temporary interference with nursing when the baby requires it most, and the loss of time to the mother, the attendants, and the hospital.

R. E. CHRISTIE, M.D.

Davis, E. P.: The Uterus After Cæsarean Section. *Am. J. Obst. & Gynec.*, 1922, iv, 333.

An important problem associated with cæsarean section is whether the operation should be terminated by sterilization or whether the patient has a fair prospect, if her pelvis is sufficiently large, of being successful in spontaneous labor in subsequent pregnancies. In addition to this problem, birth control presents itself in another phase. The obstetrician is often called upon to treat multiparæ who are near the final limit of normal child-bearing. Many of them are women in straightened circumstances who have as many children as they can properly rear. Many have reached the stage of physical decline after which pregnancy becomes progressively more dangerous. Under these conditions sterilization following cæsarean delivery might be justifiable. The condition of the uterus in such women is an important factor in deciding these questions. When sterilization is not effected and the patient elects a possible future pregnancy the method of suturing the uterus is of paramount importance.

An opportunity to examine the classical cæsarean section scar in the uterus was afforded the author by several cases in which a hysterectomy was performed after a second delivery. All of these women were operated upon by the same method, viz., turning out of the uterus from the abdominal cavity, incision through the expulsive segment, emptying of the uterus and, in suspected cases, packing of the cavity. The uterine muscle was closed with buried silk sutures, and the peritoneal covering of the uterus with catgut. In none of these cases had septic infection developed after the first operation. In those which were allowed to remain in the hospital sufficiently long a very fair degree of convalescence had been obtained. The patients were white women of the laboring class who cared for their children and did their own housework.

In one case the uterine muscle ruptured but the scar remained firm and was stronger than the uterine muscle. In the second case the uterus had undergone such fatty degeneration that extensive rupture occurred as soon as labor began. This patient was not given an opportunity to recover from her previous section and was denied the benefit of hospital care during the last month of her pregnancy.

All of these multiparæ showed the degenerative processes which inevitably occur in multiparæ without proper care during pregnancy and labor, namely, fibrosis uteri and atrophy of the muscular tissues. In a patient who was toxic at the time of the operation fibrosis and atrophy were present and in addition there was occlusion of the blood vessels by emboli and thrombi and marked round-cell infiltration at the junction of the placenta and uterus. Multiple embolism in the case of a toxæmic patient is an unusual but natural illustration of the pathology of toxæmia.

The author believes that this class of cases strengthens the arguments for birth control by elective hysterectomy at term. These women had borne children with difficulty and had done their utmost to rear these children at the expense of their own health. Under such circumstances Davis believes elective hysterectomy is justifiable and that no more practical application of birth control could be suggested.

E. L. Cornell, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Lynch, F. W.: Retroversions of the Uterus Following Delivery. *Am. J. Obst. & Gynec.*, 1922, iv, 362.

Twelve hundred and thirty women who were delivered at term in hospital wards were examined thereafter at intervals for a minimum of four months and a maximum of twelve months. There were no known pelvic inflammations in the series of cases. During the period of this investigation 2,037 women were delivered at term. This study is therefore based on 60.3 per cent of the total number of women delivered at term. The following conclusions are presented:

1. Retrodisplacements were noted in 41.1 per cent of 1,230 women kept under observation for four to twelve months after delivery.

2. Thirty-two per cent of the 505 women with retroposition came back because of pelvic symptoms. Ten and a half per cent of 725 controls with upright uteri complained of slight symptoms.

3. Nineteen and six-tenths per cent of 186 private patients presented uterine retroposition in contrast to 44.8 per cent of 1,044 clinic patients. Therefore hard work may be an important etiological factor of retrodisplacement.

4. Replacement of the uterus and pessary support gave anatomical correction in 72 per cent of the cases. Symptomatic cure and anatomical correction were obtained by identical procedures in 68 per cent of the 616 cases with symptoms.

5. Subsequent pregnancies occurred in 15 per cent of the women who did not have displacements, in 10 per cent of the women who had been treated for retroposition, and in 5 per cent of the women whose retroposition had not been corrected.

6. No one type of suspension has been found entirely successful. Following 155 operations there were two recurrences which made necessary a new round-ligament fixation upon the uterine fundus (108 Webster, thirty-one Coffey, sixteen atypical). There were four recurrences following twenty-eight Kelly-Neel suspensions with shortening of the upper part of the uterosacral ligaments.

7. The importance of early correction of retroposition following labor is clearly evident.

E. L. Cornell, M.D.

NEWBORN

Munro, D., and Eustis, R. S.: The Diagnosis and Treatment of Intracranial Hæmorrhage in the Newborn: A Report of Fourteen Treated Cases. *Am. J. Dis. Child.*, 1922, xxiv, 273.

The authors give a comprehensive review of the literature on hæmorrhage in the newborn and report

fourteen cases they have treated. From their study they come to the following conclusions:

1. Cases of intracranial hæmorrhage in the newborn may be classified etiologically into three groups: (1) the traumatic group; (2) the "asphyxia" group; (3) the fœtal disease group.

2. The diagnosis of intracranial hæmorrhage in the newborn should be based on: (1) the history and physical examination; (2) the measurement of intracranial pressure by spinal manometer; (3) the coagulation and bleeding times.

3. The treatment of intracranial hæmorrhage in the newborn depends on: (1) the successful etiological classification of the case; (2) the recognition of the intracranial pressure.

4. The treatment of intracranial hæmorrhage due to hæmorrhagic disease consists of the administration of normal whole blood subcutaneously until the bleeding and coagulation times have returned to normal, followed by measures for relieving the intracranial hypertension.

5. The treatment of traumatic cases consists of the prompt elevation of depressed fractures and the relief of intracranial hypertension by drainage by lumbar or ventricular puncture as indicated, or typical subtemporal decompression.

6. The treatment of "asphyxia" cases consists of relieving the intracranial hypertension by lumbar or ventricular puncture as indicated, or by the performance of a typical subtemporal decompression.

7. Cerebral localization of pathology in the newborn is rarely possible. Therefore corrective surgical measures are impossible.

8. The pathology, diagnosis, and treatment of Little's disease should be studied more extensively from the point of view of intracranial pressure.

C. H. Davis, M.D.

MISCELLANEOUS

Stimson, C. M.: The Influence of the Placenta on the Mammary Gland. *Am. J. Obst. & Gynec.*, 1922, vi, 413.

It would appear that during pregnancy there is something in the maternal blood which inhibits lactation, and that lactation occurs only when this substance is eliminated. In the case cited lactation did not occur during the presence of attached placental tissue within the uterine cavity, and in certain cases of abortion milk does not appear in the breasts while placental tissue remains attached in the uterus. These facts therefore suggest that the placenta is the inhibitor of the mammary gland, holding it in check until its function is necessary.

E. L. Cornell, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Rovsing, T.: The Surgical Treatment of Nephritis and Aseptic Nephrosis (Sur le traitement chirurgical des néphrites et néphroses aseptiques). *Acta chirurg. Scand.*, 1922, lv, 136.

In 1901 Rovsing reported five cases of nephritis treated by decapsulation of the kidney or, as he termed it, "nephrolysis." The operation was indicated by pain or hæmaturia. In Rovsing's opinion the effect of the nephrolysis was due principally to relaxation of the strangulated kidney. He believes the operation is indicated chiefly in cases in which perinephritic processes cause pain and hæmorrhage and obstruct the renal circulation. In 1901 it had not occurred to Rovsing that decapsulation might cure severe nephritis without distention of the capsule and he expressed scepticism when Edebohl proposed it for all types of chronic medical nephritis. Rovsing now believes it is indicated whenever medical treatment has no appreciable results. He has performed it in seventy-seven cases, thirty-seven those of men and forty those of women. A lumbar incision is made, the capsule is split along the convex border, and each half is turned back toward the hilum. The capsule is extirpated only if it is markedly abnormal. The cases treated are classified into four groups:

Group 1. Interstitial nephritis or perinephritis with crises of pain and hæmaturia but without albuminuria between the crises. Twenty-six cases of this type were cured by nephrolysis. In Rovsing's opinion these are cases of uric or oxalic toxic effects on the tissues.

Group 2. Interstitial nephritis associated with albuminuria, pain, and hæmaturia, and often nodular. There were thirty-two cases of this type, eleven of them with advanced renal atrophy. Two of the patients died shortly after the operation, two died after temporary improvement, nine were greatly benefited, and nineteen appeared to be entirely cured. Good results were obtained even in some of the cases with advanced renal atrophy although the deaths and poorest results were also in this group.

Group 3. Diffuse parenchymatous nephritis (chronic nephrosis). In this group there were eight cases. Nephrolysis resulted in a cure in four cases and temporary improvement in two. In two others it had no effect. In the latter the renal affection was unilateral; in one, nephrectomy was done later and was followed by complete recovery.

Group 4. Glomerulonephritis. In two of the three cases of this type the condition was unilateral. These two cases were cured by nephrolysis but in the third the operation had no effect.

W. A. Brennan.

Darnall, W. E. Malignant Papilloma of the Kidney. *Surg., Gynec. & Obst.*, 1922, xxxv, 491.

The case reported in this article is the fifty-seventh recorded in the literature. Twice as many males are affected as females and the condition may occur at any age. The etiology is unknown, but inflammation and stone have been held responsible. The tumor may be a small, isolated, bud-like growth or a single, large cauliflower mass filling the renal pelvis and destroying the renal parenchyma. It shows a marked tendency to involve the lower urinary tract secondarily.

The symptoms vary according to the size of the growth. Hæmaturia is the most common sign. This varies in intensity and usually is intermittent. Pain is more or less inconstant and radiates down the loin. The symptoms may persist for years. It is possible that some of the cases diagnosed as essential hæmaturia may be of this type. The condition should be suspected in the presence of negative roentgenograms, colic along the ureter, diminished or absent function of the suspected kidney, and a palpable mass in the loin. If, in addition, cystoscopy reveals a papilloma at the ureteral orifice, if the pyelogram reveals a filling defect in the renal pelvis, and if the urine contains unidentified epithelial cells, the diagnosis is practically certain.

The treatment in all cases is extirpation of the affected kidney with as much of the ureter as possible. When there is bladder involvement subsequent filguration is indicated. L. Neuwelt, M.D.

BLADDER, URETHRA, AND PENIS

Figurnoff, K. M.: The Pathology and Treatment of Fibromyomata of the Urinary Bladder (Pathologie und Therapie der Fibromyome der Harnblase). *Neuy Chir. Arch.*, 1922, ii, 134.

This detailed study is based on the following case which was diagnosed clinically by a gynecologist and treated surgically by Fedoroff who performed a transperitoneal operation. Seven years previously the patient, a woman of 30 years, had had hæmaturia for several weeks. Since that time she had been "well" until six months ago, when another attack occurred. Micturition was painful and frequent and emptying of the bladder was impossible unless the patient stood partially upright with the body bent slightly backward. The uterus could be demarcated from a firm, slightly movable tumor, the size of a lemon, which presented small nodules on its surface. The growth thinned the anterior vault of the vagina and caused it to project forward.

Cystoscopic examination showed that the normal mucous membrane was pushed forward in the right posterior quadrant by a tumor the size of a walnut.

The right ureteral opening was higher than normal and gaped open but contracted at the escape of urine. The capacity of the bladder was 320 c.cm.

At operation it was found that the neoplasm involved almost half of the bladder. Where the tumor projected into the lumen the vesical wall was resected. The rest of the growth was removed by morcellation with the exception of the tumor nodule enclosing the ureter. A drainage tube was then inserted and the bladder sutured around it.

After the operation the patient was kept in the abdominal position for two weeks. A self-retaining catheter was then inserted and the patient changed to the dorsal position. The abdominal fistula was closed at the end of four days. When discharged from the hospital the patient was free from symptoms and the capacity of the bladder 230 c.cm. Cystoscopic examination two months later showed a linear scar which was stellate below and extended upward into a diverticulum. The right ureteral opening was widened and round, but active contractions could be observed. The left orifice was widened and drawn toward the right as far as the midline.

Histologic examination showed the tumor to be an interstitial fibromyoma of diffuse growth which had undergone mucoid degeneration at the center and was without an endothelial lining.

The author has found forty-two myomatous tumors of the bladder described in the literature since 1871; only three were interstitial fibromyomata. Kusnetzkich's case is noteworthy in that the fibromyoma grew on the periphery and attained a size equal to that of the uterus at the end of pregnancy and a weight of 9 kgm.

VON DER OSTEN-SACKEN (Z).

GENITAL ORGANS

Herbst, R. H., and Thompson, A.: Carcinoma of the Prostate. *J. Am. M. Ass.*, 1922, lxxix, 1654.

The authors review the literature on prostatic cancer and their own experience with the condition. They found that at least one in every four tumors of the prostate was malignant, and in one-third of these cases there was evidence of bone metastases. A rather small number of the patients seek treatment sufficiently early to obtain permanent relief. Those with cancer do not develop urinary symptoms until late. Early diagnosis is particularly urgent in cancer of the prostate because it is a silent disease symptomatically until it is far advanced.

Pain along the sciatic nerve is the one symptom associated with early malignancy which should attract attention to the prostate in men of advanced age. Pubic and sacral pain and pain in the back are usually significant of extensive local involvement, but may be caused in some cases by glandular or bone metastases. The significance of increased resistance which is often found in the intervesicular space just above the prostate gland must not be forgotten.

This infiltration produces an elevation of the trigone, termed the "subtrigonal plateau" when seen on cystoscopic examination. It can be felt more distinctly if a cystoscope is introduced into the bladder and the beak turned downward toward the trigone. Obliteration of the interlobular sulcus is also a characteristic rectal finding in malignancy.

From the standpoint of treatment cancer of the prostate is of three pathologic types:

1. A scirrhous type, which usually begins in the posterior lobe in the form of small, flat, or nodular areas. The process develops and spreads behind the urinary tract rather than into it. Therefore urinary symptoms do not develop until late.

2. A combination of Type 1 and benign hypertrophy of the upper portion of the prostate. This is difficult to differentiate from simple hypertrophy, the malignant area often being discovered only at operation.

3. A less common form of tumor in which the entire gland is involved by adenocarcinoma. These tumors are as a rule smooth and symmetrical but harder than the adenoma. Metastases do not occur as frequently as in Types 1 and 2.

The authors have obtained better results in cases of Types 2 and 3 than in those of Type 1 because the early development of urinary symptoms caused the patients to present themselves for treatment before metastases had developed.

Herbst and Thompson applied treatment through the opened bladder because it gave easy access to the tumor, especially the subtrigonal area, and relieved urinary retention.

In addition to facilitating the introduction of radium, a suprapubic cystotomy protects the upper urinary tract and does much to make the patient comfortable during the weeks or months that treatment is carried on.

Some of the best results were obtained in cases in which it was possible to enucleate an adenomatous middle lobe, fit a tube of radium into the cavity, and insert several needles containing radium into the malignant part of the remaining shell. Such radium treatment may be repeated if the bladder is kept open, or subsequent applications may be made by passing into the urethra a staff carrying a tube, introducing long needles through the perineum, or both.

Most observers agree on the value of the roentgen ray in conjunction with radium therapy.

LOUIS GROSS, M.D.

Cecil, A. B.: A New Technique for Performing Perineal Prostatectomy. *J. Am. M. Ass.*, 1922, lxxix, 1661.

Cecil has been convinced for some time that if Young's operation could be altered so as to rid it of technical difficulties, it would lend itself to more general use. He therefore turned his attention toward the development of a procedure which, while less difficult technically, would absolutely insure the integrity of the muscles of urinary control

and at the same time would protect the rectum from injury.

The result was the devising of a tractor which can be easily introduced through the entire length of the urethra and, when opened in the bladder, is efficient in bringing the prostate into the wound, thus preventing all possibility of injury to the external sphincter muscle and any unnecessary scar formation in the region of this muscle.

The uncertainty in dividing the recto-urethralis muscle was met by changing the shaft of the handle of Young's bifid and spatula retractors so that while these are held firmly in position the operator is able to place a gloved finger in the rectum to the apex of the prostate and thus carry out the dissection under the sense of touch rather than by purely anatomical landmarks.

In Cecil's technique the patient is placed on the table in the exaggerated lithotomy position and the bladder partially filled with fluid to permit the easy opening of the tractor. The curved tractor is then passed into the bladder and the V-shaped incision made in the perineum. The limbs of the curved V-shaped incision extend quite far back and the incision is carried through the subcutaneous tissues rather boldly. The finger is then passed down into the fossa in front of the fibers of the levator ani muscle and the bifid retractor is introduced.

With a pair of thumb forceps the tissues are picked up just back of the bulb and the central tendon is divided straight downward. With the set-off bifid retractor then held firmly in place, a gloved finger is introduced into the rectum, and by means of a specially devised, delicately curved clamp, the entire bridge of tissue down to the apex of the prostate is grasped under the direction of the guiding finger in the rectum. The tissues are cut across above the clamp with definite assurance that the rectum will not be injured, and in this manner the fibers of the recto-urethralis muscle are divided far back rather toward the rectal wall than toward the region of the external sphincter.

The handle and shaft of the tractor are then brought toward the operator, its bladder end thus being thrown freely into the bladder cavity so that the tractor may be easily opened, and by turning of the thumb screw the bladder end of the tractor is thrown at right angles to the shaft. Then, by lifting on the tractor and pushing it away, the apex of the prostate is brought quite far up into the wound. The fibers of the levator ani muscle are pushed aside and the rectum is stripped back along the fascia of Denonvillier.

Up to this point the urethra has not been opened. The usual lateral incisions of Young are made as these have been found preferable to the throwing back of a large bridge of tissue. Adenomatous masses are freed by a blunt dissector and removed through each lateral cavity by Young's technique. When the masses from the lateral cavities and any suburethral lobes encountered have been removed, an incision 2 cm. in length is made through the right lateral cavity and the edges of the prostatic urethra are picked up with Allison forceps.

The tractor is then removed and in difficult cases it is sometimes found advisable to introduce the straight tractor through this opening. A finger is passed in through the prostatic urethra and the neck of the bladder palpated. If an intravesical lobe is encountered, it is removed through this opening. If the neck of the bladder is found contracted, it is divided. After the removal of all obstructing tissue, a single-way drainage tube is introduced through the lateral cavity into the bladder and packed about with cephalin gauze to control hæmorrhage.

LOUIS GROSS, M.D.

SURGERY OF THE EYE AND EAR

EYE

Wiedemann, H.: Injuries of the Visual Tracts of the Brain (Die Verletzungen der Sehbahnen des Gehirns). *Ztschr. f. aerztl.-soz. Versorgungsw.*, 1922, i, 437.

More frequent than direct injuries of the optic nerve are indirect injuries due to fractures or fissures of bone. Usually other cranial nerves are also involved (the third, fourth, first, fifth, and sixth). In every case in which the lesion lies distal to the entrance of the central vessel into the optic nerve (10 to 20 mm. behind the bulb) ophthalmoscopic signs are evident immediately. At the chiasm a lesion of the cross fibers produces bitemporal hemianopsia whereas an injury behind (central) the crossing causes a so-called homonymous hemianopsia.

A loss of both the left halves of the visual field occurs with injury of the tract of the primary visual centers, the optic radiation, and the right cuneus. As the pupillary fibers branch off at the primary visual centers, the pupillary reaction is normal in cases of central lesion, but when the lesion is situated further forward there is a hemianoptic reaction. As the visual sphere in the cuneus has a wider expanse, its incomplete destruction does not cause hemianopsia but homonymous scotomata result.

With destruction of both the visual spheres, cortical blindness, viz., blindness with an unchanged pupillary reaction, occurs. Mental blindness, a condition in which the object is perceived but not recognized, is due to double injury of the convex side of the occipital lobe or its medullary layer and is an optic agnosia. Alexia is another type of the same condition. This is occasionally seen in association with conjugated paralyses of the eye muscles following destruction of the angular gyrus.

MEISNER (Z).

Wilkinson, O.: The Present-Day Status of Squint Surgery: A New Operative Technique. *J. Am. M. Ass.*, 1922, lxxix, 1417.

On the basis of seventy-five cases operated upon during the past two years Wilkinson draws the following conclusions:

1. It is necessary to operate on children sooner than has been our practice in order that we may favor binocular vision at an age when binocular vision may be acquired.

2. We are able to straighten any case of squint at any age without doing a tenotomy or in any way cutting or interfering with the function of the internal rectus. A tenotomy of any grade is contraindicated in squint in young children.

3. In cases of deviation of 24 degrees or less it is sufficient to advance the external rectus in the squinting eye only. In cases of higher degrees of deviation it is advisable to advance the external rectus muscles of both eyes.

4. In young subjects with low degrees of deviation about 3 mm. of shortening is required to each 5 degrees of deviation; i.e., in a case of squint of 15 degrees in a child under 10 years of age about 9 mm. of shortening of the external rectus would be necessary to secure an accurate and permanent effect. In a case of from 20 to 25 degrees of deviation each 0.5 mm. will correct 1 degree of deviation. In older subjects, 0.5 mm. of shortening will approximately correct 1 degree of deviation. This holds good except in the very low degrees up to 12 or 14. The lower degrees require the ratio of 3 mm. of shortening to 5 degrees of deviation. In a few cases the author has shortened the external rectus 15 degrees. He finds that the ratio decreases; for example, that 15 mm. will correct from 30 to 35 degrees of deviation. However, he advises against trying to advance a muscle to such an extent because it is more difficult, it may restrict the movements of the eye, and it may cause some exophthalmos.

In cases with high degrees of deviation, say 40 degrees, a 10-mm. advancement of each external rectus is necessary. In cases of deviation of 50 degrees or more, the ratio increases; 12 mm. of advancement of each external rectus with the wearing of the brace ten days will correct as much as 50 to 55 degrees of deviation whereas 12 mm. of advancement on one eye only will certainly not correct more than 25 degrees of deviation. It seems that when both eyes are operated on at the same time the ratio of correction is somewhat increased.

5. Over-correction is necessary to secure a permanent result. The eye should deviate about 8 to 10 degrees after the stitches are out and the brace has been removed. This is an advantage as it aids the fusion faculty to secure binocular vision as the previously crossed eye is assuming its permanent position.

6. The use of the caliper or some definite measuring device is essential for accurate work. The method of suturing through the stump avoids the dangerous scleral stitch and secures a firm anchorage, while the placing of the suture in the well-dissected muscle makes possible more exact measurement of the amount of shortening produced. The importance of this is evident as it enables us to operate on children under ether anæsthesia with the same confidence with which we operate on adults under local anæsthesia, and to operate before fixed habits are formed, before anatomical changes in the muscles and blindness of the squinting eye develop, and before the possibility of fusion training is lost.

JAMES P. FITZGERALD, M.D.

Wood, D. J.: Intra-Ocular Cysticercus. *Brit. J. Ophth.*, 1922, vi, 439

Wood has seen six cases of intra-ocular cysticercus, two of which he discusses in this paper. In one of the two cases discussed there was some doubt in the diagnosis. The other was that of a druggist who was also a farmer and who came to Wood because of pain in the left eye of three weeks' duration which had been much more severe for four days. On the lower outer part of the iris was a very definite cystic body, white in the center, projecting into the pupil, and fixed to the iris by numerous fine threads like spider-web or cotton wool. There was severe iritis. Atropin produced no effect, and after a few days it was evident that the cyst was larger. No movements could be detected, but observation was difficult because of severe photophobia.

Under an anæsthetic Wood tried to remove the cyst with its bit of iris, but at the first touch of the forceps it ruptured into the anterior chamber. Fragments were removed, but the threads were elastic and held to the iris. No booklets were found in the débris. The threads appeared to be hyaline, with cells at intervals. There was immediate relief from the pain, but when the patient left the hospital the pupil was largely occluded by lymph.

THOMAS D. ALLEN, M.D.

Wood, D. J.: Onyx of Long Duration. *Brit. J. Ophth.*, 1922, vi, 438.

The patient, a woman aged 26 years, consulted Wood for the removal of a white mark from her left eye. On casual inspection this mark had the appearance of a round nebula with a yellow opacity in its lower part. The patient stated that it had been present ever since she had measles twenty years previously.

Careful examination revealed a round cavity like a double watch glass which contained some thick pus in its lower part and on pressure became changed in shape. The cavity had a clearly defined circular margin and extended from the corneal margin to the inner third of the pupil. The eye was perfectly quiet, there had never been any pain, and the patient was unaware that any change had occurred. The cavity extended back to Descemet's membrane. The fundus was visible through the clear part of the cornea, and vision was 6/36.

Wood incised the cavity with a discission needle and removed the pus by irrigation. The eye then looked nearly normal. While the outline of the cavity remained clearly visible on careful inspection, it was no longer conspicuous.

THOMAS D. ALLEN, M.D.

Haessler, B. T., and Haessler, F. H.: The Early Development of the Corneal Tubercle, a Study in Slit-Lamp Microscopy. *Arch. Ophth.*, 1922, li, 543.

This paper reports a study of the development of experimental tuberculosis of the cornea in rabbits. Three strains of bacilli were used, two of them virulent and one not virulent. For comparison the authors inoculated another group of rabbits with a solution of staphylococcus aureus and in a third group injected mercuric sulphide.

The use of the slit lamp and microscope made it possible to observe much earlier changes than those recorded by other investigators. The first changes in rabbits injected with tubercle bacilli appeared from three to eleven days after the injection. No explanation can be offered for the delay of more than four days except that it must have been due to higher resistance in the animal.

The first change observed was a very faint injection of the conjunctival vessels at the limbus. In the white rabbits a pronounced acceleration of the circulation at the limbus was always noted at the same time. Not only were the vessels dilated but the blood flowed through them with much greater rapidity. In all the white rabbits inoculated with a virulent strain of bacilli an injection of the small vessels of the iris preceded or accompanied the limbus hyperæmia. In the eyes injected with mercuric sulphide there was injection of the vessels of the bulbar conjunctiva but no pronounced acceleration of the circulation at the limbus

Cellular deposits on Descemet's membrane were easily seen when a virulent culture was used. As a rule these deposits were found on the most dependent part of the cornea. Those noted on the lens were quite irregularly distributed, but most numerous in the periphery. The greatest changes were found in the cases in which a heavy emulsion was used for the injection.

The formation of vessels was perhaps the most characteristic of the lesions seen in tuberculosis of the cornea. The earliest vessels were always observed at the limbus above, wherever the corneal injection was made. These vessels usually attained a greater length than those coming in from below or the sides, and eventually extended into the opacity at the site of injection. In the most advanced stages the entire cornea was sometimes vascularized. The earliest vascular shoots were seen two or three days after the first signs of reaction. They developed as short strands coming off of the superficial conjunctival vessels at the limbus and lay superficially on the cornea throughout their course. After two or three days of growth they met and formed capillary loops through which an exceedingly active circulation was maintained. As the vessels became larger they assumed a broom-like growth and increased in width as well as length. They grew much more rapidly when a virulent culture was used. When healing began, the circulation gradually became slower and the vessels decreased in size. In the authors' experience the proximal loops never completely disappeared, though they have been grossly invisible. When such an eye was re-injected or otherwise irritated the blood flow through these capillaries was increased and they could again be seen with the unaided eye as a fringe of newly formed vessels.

THOMAS D. ALLEN, M.D.

Charles, J. W.: Neuropathic Keratitis the Result of Focal Infection. *Am. J. Ophth.*, 1922, v, 783.

The author gives his reasons for considering dendritic keratitis a terminal nerve lesion and reports a case which resisted all of the usual methods of treatment but responded in two or three days to palliative treatment for suppurative ethmoiditis.

JAMES P. FITZGERALD, M.D.

Lent, E. J., and Lyon, M. B.: Embryonic Fibrovascular Sheath of the Crystalline Lens. *Am. J. Ophth.*, 1922, v, 796.

The authors review the literature, report an interesting case, and discuss the differential diagnosis of embryonic fibrovascular sheath of the crystalline lens. This condition may be mistaken for glioma, but as glioma grows rapidly, careful measurement over a short period will determine the diagnosis.

Glioma is visible with the naked aperture if seen early but a fibrovascular sheath requires the use of a plus 16 to plus 20 lens to bring out the very minute vessels connected with it.

JAMES P. FITZGERALD, M.D.

McCabe, F. J.: Glaucoma, Its Etiology and Treatment. *Rhode Island M. J.*, 1922, v, 305.

McCabe briefly reviews various theories regarding the cause of glaucoma and the results obtained by operative and non-operative treatment. He recommends combining the two methods, considering each case individually, studying the condition carefully, and regulating the patient's habits and diet. For glaucoma simplex with little or no increase in tension and only slow change in the fields of vision he believes conservative treatment is best.

T. D. ALLEN, M.D.

EAR

Eitner, E.: The Correction of Prominent Ears (Anlegen und Verkleinern abstehender Ohrmuscheln). *Med. Klin.*, 1922, xviii, 1117.

Previous to the operation, the ear is brought to the desired position and the most extreme line of contact between its posterior surface and the skull is marked. If the ear is drawn sharply downward, the line of demarcation appears as an ellipse, the long diameter of which is formed by the fold of reflection. The skin incision is then made through the transverse diameter and the skin and perichondrium are reflected up to the mark. The cartilage is divided in the same direction and a sickle-shaped piece removed in a direction vertical to the incision downward and upward. If it is desired merely to fasten the ear down, the strip need be only a few millimeters wide, but if a reduction in the size of the ear is also desired, the strip must be correspondingly wider. After the suturing of the cartilage and the perichondrium the skin is excised to the line of demarcation and the ear fixed in the desired position by three or four sutures. TROMP (Z).

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Dean, W.: A Case of Suppurative Ethmoiditis Complicated by Orbital Cellulitis and Acute Suppurative Dacryocystitis. *Kentucky M. J.*, 1922, xx, 630.

In the author's case there was a history of nasal catarrh for many years, obstruction of the nasal lachrymal duct for seven years, and a purulent discharge from the nose for two months. Two days before the patient was seen by Dean, the discharge stopped and the eye became swollen shut. At the time of examination the pain was intense, the temperature 102 degrees F., and the face swollen. The eye protruded about ¾ in. Only the upper portion of the cornea could be seen and this was hazy. The conjunctiva was prolapsed and necrotic. On shrinking the nose no pus could be obtained. The middle turbinate was polypoid.

Several incisions were made in the lid. The lachrymal and adjacent plate of the ethmoid were found to be necrotic. Because of polypoid degeneration the anterior ethmoid cells were curetted away. A large drain was inserted through the nose into this region and several drains through the skin of the lids. Pus continued to run from the operative wounds for a number of days. A large ulcer of the cornea healed gradually. The antrum, which was found to be infected, was operated upon and treated.

T. D. Allen, M.D.

MOUTH

McArthur, L. L.: Atypical Operations on the Jaws and Mouth for Malignant Growths. *J. Am. M. Ass.*, 1922, lxxix, 1484.

Case 1. The patient was a man 40 years of age with a history of pyorrhœa and consequent removal of the first and second incisors followed by carcinoma of the unhealed gum and alveolar process with slow invasion in both directions. Examination showed no invasion of the antrum or orbit. The usual skin incision having been made, the two superior maxillæ were divided from each other by an electric saw: (1) at the line of the first left incisor through the palatal portion mesially, (2) at the superior maxilla and malar junction, and (3) at the nasal orbit along the entire length of the infra-orbital margin. The inferior orbital plate and the superior maxilla were left intact. The function and appearance of the eye remained unchanged. No cervical glands were evident and none has yet been excised.

Case 2. This case was that of a man with a recent small growth involving the gum, the alveolar process, and the jaw at the former site of two lower molars, and a definite palpable gland immediately beneath the right tonsil. The microscope showed carcinoma. At operation the incision was made downward from the angle of the mouth to beneath the jaw, curving back past the angle, and the flap was detached from the jaw and retracted upward. The electric saw was used to excise a rectangular section of the ramus, including the alveolar process; a sufficient amount of dense eburnated bone was left to form a bridge 1.2 cm. in each diameter to maintain the external contour. The fragment removed measured 5 cm. Sixteen days later primary union had occurred and the incision was almost invisible. The involved gland was removed without tearing its capsule. The microscope showed it to be a typical carcinomatous gland. There was no recurrence or facial deformity four and one-half years later. The patient died as the result of a fall.

Case 3. The patient was a man 44 years old who had a lesion surrounding the decayed root of the second right lower molar which failed to heal after the removal of both molars, curettage, and the use of caustics. This spot had been present for ten weeks but was not large. No glands were evident in the neck. The microscope showed carcinoma.

At operation the outer aspect of the lower jaw was exposed by an incision beginning on the lower lip at the angle of the mouth, curving downward along the natural fold of the cheek, and cutting all but the mucosa to and below the jaw. The skin of the cheek was then drawn upward and the tissues were cut backward following the jaw down to the bone. Beginning at the angle of the mouth, the mucosa was then sectioned so as to conserve as much of the normal membrane as possible. The incision was then made through the healthy soft parts and periosteum 1.2 to 1.8 cm. radially from the growth. Two perpendicular sawings and a connecting long sawing were made at a distance from the free alveolar margin to avoid beginning infiltration and to leave a strong, eburnated bony ridge to prevent deformity.

Case 4. This was the case of a 14 year old girl with a tumor of the mental prominence which deformed the chin into a round mass and loosened the incisors of the lower jaw. The pathologic report on a fragment was giant-cell sarcoma. At operation the soft tissues were separated from the chin by an incision within the mouth, the mental prominence was exposed through the buccal orifice, and the lower lip was stretched beneath the bony chin. Incision revealed a thin layer of bone covering a firm, spherical tumor. The growth was not bony and yielded readily to a sharp knife, but not to the curette. The entire mass, which was the size of an English walnut, was shelled out. The roots of the incisors protruding into the smoothly-lined bony cavity were amputated. All suspicious areas were removed, sufficient alveolar

process being left to form a bridge between the right and left maxillæ. Two years later the alveolar bridge was fractured by the chewing of brittle food. After another two years a graft from the patient's tibia was implanted and adipose tissue was inserted beneath the skin to correct the deformity.

PAUL W. SWEET, M.D.

Bainbridge, W. S.: Cancer of the Tongue: Pitfalls in Diagnosis and Treatment. *J. Am. M. Ass.*, 1922, lxxix, 1480.

The following cases were selected from 700 recorded cases of tongue lesions:

Case 1. The patient was a man, 42 years of age, who was an excessive cigar smoker and in the habit of holding the cigar in the right side of his mouth. A small, recurrent sore developed on the tongue ⅛ in. from the right side and 1½ in. from the tip. This sore had received mixed treatment with silver nitrate, the roentgen rays, and other agents but had persisted for a number of years. Repeated Wassermann tests were negative. The mouth was in a fœtid condition, and there was involvement of the glands of the neck. The involved glands were removed, the lingual arteries were ligated, and a few weeks later the tongue was completely excised. Following the operation the patient gained in weight and strength and became able to attend to his business. One year later he died from recurrence in the neck.

Case 2. A man, aged 49 years, noticed in May, 1902, a small, elevated spot half way back on the dorsum of the left half of the tongue. Following the local application of alum and the discontinuance of smoking this lesion disappeared but it reappeared when smoking was resumed. The patient came for consultation in December, 1903, when he had lost considerable flesh and strength and was somewhat cachectic.

Examination revealed a hard, crater-like ulcer involving the left anterior third of the tongue with the exception of the tip which was covered with a brownish, fœtid fur. The reports of two pathologists confirmed the diagnosis of vascular epithelioma. Immediate operation was refused by the patient who insisted upon a trial of roentgen-ray treatment. The latter proved futile despite nine weeks' systematic application. In the meantime the growth extended to the right side of the tongue and induration of the floor of the mouth became evident. Several glands were palpable on both sides of the neck, and there was marked dysphagia. In March, 1904, the submaxillary and sublingual glands on either side were removed with the salivary ducts, and the lympathic neck glands were removed en masse where this was possible. Two weeks later the tongue was completely excised and also a large part of the geniohyoglossi, the hyoglossi muscles, the inferior third of the pillars of the fauces on the left side, and part of the anterior pillars of the fauces on the right side. In a few hours the patient was able to swallow fluids. He was discharged a month later when he had gained 10 lbs. He was then able to masticate solids, to taste, to talk intelligibly, and even to sing. In May, 1912, a small ulcerating lesion appeared in the anterior portion of the mouth. This was fulgurated. A few days after the operation the patient succumbed to pneumonia.

Cases 1 and 2 demonstrate that some cancers of the tongue are not recognized as such, but are mistakenly diagnosed and treated as non-malignant neoplasms.

Case 3. This patient, a man aged 41 years, was operated upon in January, 1907, for the removal of a small nodule on the tip of the tongue. A wedge-shaped section (2.5 cm. long) of surrounding healthy tissue was also excised. The patient refused excision of the neck glands. The microscope showed suspicious cells only at the apex of the removed section and none in the nodule. The following day another small section was removed at the apex of the incision in the tongue. There was no recurrence of the epithelioma. The patient disappeared during the recent war.

Case 4. The patient was a man aged 60 years who, in December, 1915, discovered a small, wart-like spot on his tongue. A diagnosis of cancer was made and radium applied once in January and again in March, 1916. As the spot continued to increase in size, excision of the tongue was advised. Examination showed the tongue to be spotted with leukoplakia. In the center was a typical epithelioma within an ulcerating mass the size of a five-cent piece. The surface of the tongue suggested syphilis. The Wassermann reaction was 4 plus. After five weeks of antisyphilis treatment the inflammation subsided, leaving an ulcer the size of a split pea. The cancerous and sclerotic part of the tongue was removed by a conservative operation. The pathologic report was epithelioma. The patient recovered but in January, 1921, died of acute pneumonia.

Cases 3 and 4 demonstrate that errors are made in diagnosing the type, stage, and extent of tongue cancer.

Case 5. The patient was a woman 28 years of age with a history of appendectomy performed in September, 1919, and followed the next day by a sore a little to the left of the median line on the lower lip. The lesion was diagnosed as a "fever" or "ether" sore, and treated wth ointments. It increased in size, and laboratory examination six weeks later showed angiosarcoma with considerable mitosis. Radical operation was advised. Examination of the lip in October, 1919, showed an elevated, hard, indurated ulcer the size of a ten-cent piece. The tongue was covered with leukoplakia spots, one of which was nodular. One neck gland under the chin and two in the left submaxillary region were involved. The Wassermann test was 4 plus. After antisyphilis treatment consisting of four intravenous and six intramuscular injections and the local application of mercurial ointment the mass on the lip and the neck glands disappeared. As the Wassermann reaction remained unchanged, the antisyphilis

treatment was continued. In February, 1921, the Wassermann test was negative. In May, 1922, the patient reported excellent health and a continued negative Wassermann reaction.

Case 6. A man, aged 49 years, sought treatment for a sore at the base of the tongue which had been noticed for nine months. The Wassermann reaction had been negative. A diagnosis of cancer was made and radical removal of the tongue advised. Examination in June, 1917, showed a deep ulceration 2.5 cm. wide extending backward from the anterior one-third of the dorsum of the tongue to the epiglottis; also enlarged cervical and supraclavicular glands. Two pathologists reporting on section excluded cancer. After a few weeks of antisyphilis treatment the ulceration disappeared. There was no recurrence for seven years. The patient was lost sight of during the recent war.

Case 7. The patient was a boy, aged 15 years, whose tongue showed a swelling the size of a cherry which had been present for eight months and had begun to grow larger. The tumor was diagnosed as malignant and the patient referred for radical operation. Examination in March, 1914, showed an irregularly-edged tumor the size of a walnut situated on the right margin of the tongue and extending nearly to the center. The surface of the tongue was wart-like and much inflamed. The lesion was diagnosed as benign and the growth and ulcerated area were removed. The pathologic report was "lymphangioma papillomatous type." Three months later an angioma of the mouth was removed. There was no recurrence for more than eight years.

Cases 5, 6, and 7 demonstrate that lesions of the tongue may be mistakenly diagnosed and treated as cancer.

PAUL W. SWEET, M.D.

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INTERNATIONAL ABSTRACT OF SURGERY

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COLLECTIVE REVIEW

EMPYEMA[1]

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INTRODUCTION

THIS collective review is not an attempt to solve the problem of empyema, but discusses some of the numerous views. Neither can it be claimed to offer anything new in reference to the etiology, pathology, or treatment. Its chief object is to present as impartially as possible the data advanced by certain writers. Men of great ability as surgeons and internists differ widely regarding this condition and especially with regard to its treatment. This is especially true of those who have made reports during the past five years, possibly because an unusually large number of empyema cases followed the recent epidemics of measles, influenza, and various types of pneumonia.

A study of their papers reveals the fact that a great number of writers are not familiar with the history of the treatment of empyema. This is evident from what they regard as new discoveries and new methods of treatment.

As stated in an editorial (1): "A knowledge of medical history is a most distressing thing for it discloses persistently that this or the other new discovery is only a rediscovery. We must take our consolation in the fact that generally the first steps were but halting ones, not being backed by sufficient force of actual knowledge to permit them to reach their goal, and hence our newer progress on a more substantial basis is, after all, the only worthwhile advance."

In abundant material it is not unusual to discover apparently new diseases, new symptoms, or new relationships between diseases and symptoms, and apparently new methods of treatment. Moreover, findings which in isolated cases do not seem striking assume added importance when seen in numerous cases in a brief period of time.

[1] Approved for publication, office of the Surgeon General.

HISTORY

In order that the reader may have a clearer conception of the evolution of the modern methods of treatment, a brief résumé of the history of the treatment of empyema seems warranted even at the risk of repeating facts known to many.

The term "empyema" (ἐν = within, and πύον = pus) appears to have been used by the ancients to designate an internal collection of pus in the pleural cavity, the lung substance (abscess), or the cavities of ulcerative tuberculosis. Aetius (2) is believed to have been the first to restrict the term to pleural collections.

The first description of the symptoms and nature of empyema is generally credited to the great master Hippocrates, who made frequent mention of the condition in his writings (4). It is fully described also in the books of the Hippocratean school (Cos), but there is some doubt as to whether these were the product of his pen. It appears that Hippocrates gained his knowledge of empyema and other diseases from his ancestors, the Asclepiadæ, who presided over the temples of health in Greece and are the accredited authors of the first book of Prorrhetics and the Coan Prognostics which together, according to Adams (4) and other authorities, formed the basis of the Prognostics of Hippocrates and contained an excellent account of the means of recognizing

this disease, one of the oldest known to medicine (3). There is no doubt that Hippocrates was familiar with both forms of pus collections in the thoracic cavity—tuberculous cavitations and empyema—as we know them today. This is evident from Paragraph 17 of the translation of the Prognostics given by Adams:

"Empyema may be recognized in all cases by the following symptoms: In the first place the fever does not go off, but is slight during the day and increases at night, and copious sweats supervene; there is a desire to cough and the patient expectorates nothing worth mentioning; the eyes become hollow, cheeks have red spots on them, the nails on the hands are bent, the fingers are hot, especially their extremities; there are swellings in the feet, they have no desire for food, and small blisters (phlyctænæ) occur over the body. These symptoms attend chronic empyemata and may be much trusted to; and such as are of short standing are indicated by the same, provided they be accompanied by these signs which occur at the commencement, and if at the same time the patient had some difficulty of breathing. Whether they will break earlier or later may be determined by these symptoms—if there be pain at the commencement and if dyspnœa, cough, and ptylism be severe the rupture may be expected in the course of twenty days or still earlier; you may expect from these the rupture to be later, but the pain, dyspnœa, and ptylism must take place before the rupture of the abscess. The patients recover most readily whom the fever leaves the same day that the abscess bursts—when the alvine discharges are small and consistent, the matter white, smooth, uniform in color, and free from phlegm. They die whom the fever does not leave, or when appearing to leave them, it returns with exacerbations; when they have thirst, but no desire for food, and there are watery discharges from the bowels; when the expectorations are green or livid or pituitous and frothy. If these occur they die."

It is evident from this very clear clinical picture that rupture of an abscess into the bronchus is indicated instead of rupture through the external chest wall. A similar effect is produced by artificial pneumothorax (6), a procedure first practiced over twenty-three hundred years ago.

Hippocrates was familiar also with surgical procedures and called attention to the dangers of too early operation and too speedy evacuation of the pleural contents (7). With regard to preoperative measures he stated that the patient should be prepared fifteen days after the onset of the disease by washing him very thoroughly with warm water. This recognition of the importance of cleanliness suggests the dawn of aseptic principles (8).

With regard to the use of the knife it is stated in one book of the De Morbis (5) that before the incision was made the skin was marked. Elsewhere it is stated merely that an incision was made in the skin between the ribs with a sword-like knife (μαχαίριον or μαχαιρίδι), the subjacent parts being then perforated with a pointed knife (ἤτρια ὀξυβελὴς ῥαχίζει) guarded by a piece of rag so wound around it that only a portion of its length the size of the thumb nail was exposed. When the pus was reached some of it was allowed to escape, the incision being then plugged with a stiff linen tent fixed to a thread. The tent was removed twice daily for a period of ten days for gradual evacuation of the fluid, and at the end of this time the cavity was allowed to empty itself. In order that the lung which had become accustomed to the presence of fluids might not dry too quickly, warm wine and oil were injected through the fistula (9).

Therefore, from these old masters we learn of the great danger of too early operation and too rapid evacuation of fluids from the pleural cavity. They tell us also how to prevent the loss of tents and drainage tubes in the pleural cavity by means of a linen thread, and instruct us regarding the use of oils and antiseptics in the treatment of infection. Their method of draining through the rib in order that they might have a rigid structure to cork and uncork was re-discovered by a later writer.

The teaching of the School of Cos was in vogue during the next five or six centuries. Celsus (10) mentioned empyema as a complication of fracture of the ribs. During the sixth and seventh centuries operative procedures lost favor on account of poor results. Instead of the knife, a cautery was used—a method employed by the Arabians (11).

From this period to the sixteenth century fewer writers advocated operative measures, and those who opened the chest followed the directions of Hippocrates. In 1579, Paré (12) treated empyema by intercostal incision and resection of ribs. He warned of the danger of incising the vessels near the ribs and advocated drainage of small amounts at intervals.

Early in the seventeenth century Horstus advocated early closure of chest wounds in opposition to the time-honored custom of keeping the fistula opened. The subsequent use of the trocar may also be traced to the practice of the seventeenth century.

De la Motte (13) in 1772 and Heister in 1748 advocated incision and gave up the injection of fluids into the chest cavity, which they concluded was a harmful procedure. Bass (14) was the first to suggest that air should be excluded by means of a valvular opening which would close the orifice after the fluid had escaped. In 1819 Morand (15) suggested that the effusion be aspirated once or twice at intervals of a week before the chest cavity was opened. Thus it is not surprising that when Sedillot attempted to popularize the surgical procedure, Dupuytren (16), the greatest surgeon of his time, declined operation when he himself was suffering from empyema, uttering the classical statement that he would rather die by the hands of God than by those of the doctors. The great Velpeau had lost practically all of his cases of empyema, and Dupuytren had seen only four recoveries in fifty cases. Most of the latter, however, were treated by aspiration.

In 1819 Laennec published his epoch-making work on auscultation which made the diagnosis of empyema easier. Williams (17) recommended repeated tapping and the displacement of the pus with water injected through a double-tube cannula. If the pus did not disappear he employed nitrate of silver and sodium chloride solution, a procedure rediscovered by Diederich (18).

In later years chlorinated solutions were employed. Trousseau (19) favored particularly the injection of iodine but used chlorinated solutions also.

This brings us to the more modern and refined methods of treatment. It is clearly evident, however, that the numerous new procedures advocated in the epidemic of the Great War are very similar to those employed in the past, especially the late operation advocated by the great master Hippocrates more than twenty-three centuries ago.

ANATOMY AND PHYSIOLOGY

While it may seem elementary to review certain anatomical and physiological considerations with regard to the thorax, this basic knowledge is necessary for a correct understanding of the pathology, diagnosis, and treatment of empyema. Green (20) believes that apparent disregard or misunderstanding of the true physiology and pathology of the condition was responsible for the high mortality of 84 per cent in one army camp and an average mortality of 32.2 per cent in all army camps (21).

In the following discussion the anatomy and physiology of the chest will not be described in detail, but mention will be made of the salient points having a direct bearing on empyema.

The lymphatics of the thoracic wall consist of three main groups:

1. A superficial group to the muscles and skin, most of which terminate in the axillary nodes.

2. The intercostal lymphatic vessels which drain the intercostal muscles and pleura. Those draining the external intercostal muscles run back, and after receiving the vessels which accompany the posterior branches of the intercostal arteries, terminate in the posterior intercostal nodes. Those of the internal intercostal muscles and parietal pleura consist of a single trunk in each space. These trunks run forward in the subpleural tissue, and the upper six open separately into the internal mammary nodes or into the vessels which terminate in the lowest of the internal mammary nodes (22). There are few lymphatics beneath the ribs. Stomata are found over the intercostal spaces, but not over the ribs. Lymph vessels are also numerous over the intercostal spaces (23).

3. The lymphatics of the diaphragm. These form two rich plexuses, one on the thoracic surface of the diaphragm and the other on its abdominal surface.

The anatomical relationship of the lymphatics of the chest wall explains the extension of infective processes with the formation of abscesses which have been found so frequently beneath the sternum (24) and the posterior portions of the chest wall. A point of great importance is that in resection of a rib we pass through an area with practically no lymphatics, while in thoracotomy the possibility of infecting distant parts through the lymphatic streams is greater.

The lymphatics of the lung may be subdivided into two plexuses, a superficial plexus situated beneath the pleura, and a deep plexus which accompanies the branches of the pulmonary vessels and the ramifications of the bronchi. There is little or no anastomosis between the superficial and deep lymphatics of the lung except in the region of the hilus. Miller (25) describes collections of lymphoid tissue situated beneath the pleura.

The pleuræ, like other serous surfaces, do not have sensory nerves. Therefore, contrary to the general impression, the pain or "stitch" of pleurisy is not due to the rubbing of the surfaces but is a referred pain caused, according to Mackenzie (26), by spasm of the intercostal muscles.

Under normal conditions the intrapulmonic pressure expands the lungs until they fill that part of the thoracic cavity not occupied by other organs. As the chest cavity varies with respira-

tion, the volume of the lungs must change accordingly in order that at all times the lungs will fill fully every part of the chest cavity. The expansion of the lungs is not uniform, however, since different parts of these structures are not equally extensible. The root of the lung containing the bronchus, vessels, and fibrous tissue offers the greatest resistance to an expanding force, while the bronchial and vascular ramifications radiating toward the surface with pulmonary tissue between them are more extensible and the outer 25 or 30 millimeters of peripheral lung tissue have the greatest extensibility. The expansion of the lung is accomplished by separation of the less extensible rays of tissue which permits the expansion of the more extensible pulmonary tissue between them (Keith, 27). It must be remembered also that the expansion of the lung does not take place instantaneously and equally throughout. If the chest wall or the lung is perforated so that air can communicate with the pleural cavity from without or from the bronchial tree, the lungs promptly shrink in size since the atmospheric pressures on the outside and in the inside of the sac are then equalized.

In addition to this purely mechanical action other factors must come into play in the collapse of the lung. Rees and Hughes (28) and many other observers have noted partial and massive collapse of the lung structure. Pasteur (29) was the first to attribute this to the reflex inhibition of the diaphragm which he had observed following an abdominal operation in which the diaphragm was not injured.

The intrapleural pressure is subatmospheric, being −5 millimeters during rest and −10 millimeters during inspiration.

BACTERIOLOGY

Perhaps no subject in the entire realm of medicine has been given greater attention than bacteriology during the recent pandemic of influenza. As empyema may be caused by a great variety of organisms, either primary or secondary invaders, it will be necessary to include in our discussion bacteria of associated lesions as well as those which occur in the respiratory tract.

The pleura may be infected through the chest wall, the blood and lymph streams, and the respiratory tract, and by direct extension from adjacent infected parts. Organisms introduced into the pleural cavity through the thoracic wall in gunshot or stab wounds vary in different localities, depending upon soil contamination, the clothing and cleanliness of the individual, and many other factors. In France, where intensive cultivation is carried on, numerous anaerobic as well as aerobic infections are seen. Elliott and Henry (31) report that 10 per cent of the cases of hæmothorax are infected with anaerobic bacteria. Griffiths (32) records two cases of empyema following aspiration of the chest cavity. Both primary and secondary tuberculosis of the pleura have been noted. Wilson (33) records a case due to caries of the dorsal vertebræ. Rupture of subphrenic abscesses or echinococcus cysts into the pleural cavity may lead to pus formation. The contents of these cysts are very irritating to the tissues. In one autopsy performed by the author in a case of empyema the condition was due to rupture of the œsophagus by instrumentation in the removal of a foreign body. Gonorrhœic lymphatic metastasis from a peritoneal infection has been recorded by Woodberry (34). Osler (35) states that in Munich empyema was found in about 2 per cent of the autopsies in cases of typhoid fever.

It is obvious that as a rule empyema is due to a respiratory infection. In spite of the vast amount of work which has been done on the respiratory flora, however, no definite advances have been made in determining the relationship of the normal profuse inhabitants of the upper respiratory tract to acute and chronic diseases. Bloomfield (36) believes that a serial quantitative method of culture is necessary.

Soper (37) reports that from September 12 to December 1, 1918, there were 306,719 cases of influenza among the troops in America. During the same period there were 48,079 cases of pneumonia and 19,429 deaths. The total strength of troops was about one and a half million. Therefore it is correct to say that approximately one in every five had influenza, and of these, one in six developed pneumonia, and that of the patients with pneumonia, two in five died. The total number of deaths throughout the United States, including the civilian population, was approximately 360,450.

Blanton and Irons (43) report that of a series of 357 normal persons examined before the outbreak of the influenza epidemic, a hæmolytic streptococcus was found in the respiratory flora in 75 per cent. In a study of 868 nasopharyngeal cultures on defibrinated blood-agar plates, Matz (38) isolated the influenza bacillus in 39.5 per cent, streptococci in 12.4 per cent, pneumococci in 9.4 per cent, and hæmolytic streptococci in 2.5 per cent. Small (39) records a study of 1,285 cases of pneumonia in which the incidence of empyema was 9 per cent and the sputum examinations showed that the condition was due to the pneumococcus in 48

per cent (Pneumococcus Type 1, 21 per cent; Type 2, 34 per cent; Type 4, 45 per cent.) Streptococci were found in 46 per cent of the total number of cases, and of these, 54 per cent were hæmolytic streptococci. John (40), in a study of 136 cases, isolated hæmolytic streptococci in the sputum in 36.7 per cent, pneumococci in 31.8 per cent, and the influenza bacillus in 2.4 per cent.

It must be borne in mind that the bacteria mentioned may be found also in the normal mouth and pharynx. Davis (41) reports that no lesions of importance were produced in experimental infection of the intestine with hæmolytic streptococci. Hiss and Zinsser (42) state that the hæmolytic streptococci are found less frequently in the normal mouth, but may be present without causing disease. However, the presence of the hæmolytic streptococci in the mouth in association with some lesion of the respiratory tract is apt to indicate an etiological relationship.

The positive blood cultures obtained throughout this epidemic were very few in number. John (40) reports 43.3 per cent positive cultures in the streptococcal infections, and 3.8 per cent positive cultures in the pneumococcal infections. It may be stated also that 92.8 per cent of the cases with positive cultures of hæmolytic streptococci were fatal. Blanton and Irons (43) obtained only eleven positive cultures in 510 in cases of influenza. Hamburger and Mayers (44) look upon empyema as a distinct general sepsis with associated pneumonia and quote Jochmann (45) as stating that streptococcal sepsis may progress with the picture of a lobar pneumonia which may be the source of the sepsis or secondary to it, and that the pleura may be the seat of primary empyema or serve later as a source of streptococcal sepsis. McClelland (46) reports that blood cultures were positive in 50 per cent of 4,980 cases clinically diagnosed as influenza, and that in 1,322 of these pneumonia developed which in 416 proved fatal.

In the opinion of a large number of authoritative bacteriologists the organism of Pfeiffer was not the etiological factor in the pandemic under discussion. Jordan (47) states, "We have in the pandemic influenza an infection with an unknown or unrecognized virus which increases the susceptibility of the normal individual to infection with various pathogenic respiratory organisms, and superimposed on the original infection we have a variety of secondary infections." Hektoen (48) and Vaughan (49) are of the opinion that the cause is an unknown condition complicated by secondary infections due to bacteria the type of which is dependent upon the local conditions in the different parts of the country.

Nicolle and Lebailly (50) report the experimental production of the symptoms of influenza in monkeys and man with filtrates of nasal secretions and blood from uncomplicated influenza cases. The symptoms observed were similar to those of cases occurring in the pandemic. Dujarric de la Rivière (51) produced influenza in himself by injecting the filtrates of blood from four persons suffering with influenza. More recently Olitsky and Gates (52) have succeeded in producing changes in the respiratory tract with a substance which they have been able to carry through fifteen successive animals. Because of these results they are of the opinion that they are dealing with the transmission of a multiplying agent rather than with an active substance produced by it.

On the other hand, Nuzum, Pilot, Stangl, and Bonar (53) were able to isolate the influenza organism in only 8.7 per cent of the 2,000 cases studied and therefore conclude that the pandemic was not due to a filterable virus. Krumbhaar (54) reports finding a bacillus identical with that of Pfeiffer in 75 per cent of his cases. Keegan (55) states that the results of cultures taken directly from the lungs show that bacillus influenza occurred either in pure or mixed culture in 82.6 per cent of twenty-three cases studied. Rosenau obtained it in 83 per cent of twenty-six autopsies.

In the report on the influenza epidemic in the British armies in France (56) it is stated that the Pfeiffer bacillus was recovered from ninety-one of a series of 220 specimens of sputum, from sixty of 164 specimens from the nasopharynx, and from two of sixty-eight blood cultures. Smith (57) considers bacillus Pfeiffer the etiological factor.

In various army camps the results of bacteriological examination of the pleural fluids in empyema corresponded more closely than the sputum and blood cultures. In 158 pleural exudates from seventy-five cases examined by Dwinell (58) the hæmolytic streptococcus was isolated in seventy-four, the influenza bacillus in fourteen, the hæmolytic staphylococcus in twenty-two, non-hæmolytic streptococcus in twelve, and the pneumococcus in twenty-five. Manson (59) records finding hæmolytic streptococci nineteen times in twenty-nine cases, and Brooks and Cecil (60) have found them fifty times in eighty cases. Schorer, Clark, Sanderson, and Dickson (61) report that fifty-six of eighty-one pleural exudates from 181 cases of pneumonia were purulent. Hæmolytic

streptococci were found in 53.5 per cent of the exudates, and 70.14 per cent of the purulent pleural fluids. Blake (62) has made an interesting observation on streptococcus viridans; he found that the changes occurring in the blood plates are due to the change of oxyhæmoglobin to methæmoglobin, that this occurs only in the presence of living micro-organisms, that it appears to depend upon the metabolic activity of the bacteria rather than upon the virulence of the particular strain, and that its intensity has a close relationship to the rapidity of growth. The reaction seems to depend upon oxidation and reduction, and can be obtained in the absence or excess of oxygen.

Simmons and Bigelow (63) report the presence of diphtheria bacilli in sixty cases. The strains isolated in 17.8 per cent were virulent for guinea pigs. The bacilli did not cause any symptoms, and the patients remained carriers until the empyema cavities healed.

Stone (64) compares the percentages and the types of organisms observed in the three series of cases of empyema as follows:

Series	Cases	Streptococcus Per cent	Pneumococcus Per cent
1	71	73.2	26.7
2	95	73.6	26.3
3	85	70.4	29.4

In chronic empyema the bacterial flora is quite varied. The hæmolytic streptococci remain for a long time in the exudates. Bacillus pyocyaneus was one of the most resistant organisms the writer had to contend with in the chronic cases. This was especially true in cases complicated by bronchial fistula in which appropriate treatment for the elimination of this organism could not be instituted.

PATHOLOGY

When the pleural cavities contain a purulent exudate the condition is designated as "thoracic empyema" or "purulent pleurisy." The exudate varies in quantity from a few centimeters to several liters, and its quality varies according to the mode of its formation, its etiology, and the duration of the disease.

In a restricted sense, the pathology includes only the morbid changes occurring in the walls of this potential sac which has been converted into a true cavity. As a matter of fact, however, the pleura is the primary seat of the disease in only a very few cases. As a rule, the condition is associated with other lesions of which it may be regarded a part or sequela or is due to the presence of a foreign body. Because of failure to recognize these facts protective collections of fluid in the pleural cavities in massive active pneumonia have often been evacuated surgically with fatal results.

Primary empyema may be attributed to two modes of infection. Heller (65) suggests that the pleural reactions can be induced by the absorption of bacteria inspired with the air and carried to the pleura by the lymphatics. However, as the pleural and the deep lymphatics of the lung do not anastomose very freely, this probably occurs very infrequently. Another hypothesis advanced is that in bacteriæmias the bacteria have an elective affinity for the pleura. Lichtenstern (66) remarks that in previous epidemics there were numbers of cases of severe primary "grippe pleuritis" which began with chills, a high continuous fever, extreme dyspnœa, and marked cyanosis, and in which, in a very short time, there was a rapid accumulation of pleural fluid. In repeated postmortem examinations it was definitely proved that these were primary pleurisies without any co-existing inflammatory infiltrations in the lungs. Streptococci were often found in pure culture in the exudates.

Wilensky (67) states that over 90 per cent of the cases of empyema are due to post-pneumonic processes spread by continuity from neighboring perforating abscesses, or to metastasis from distant lesions. Rosenbach (68) suggested that many cases of post-pneumonic empyema may be induced by rupture into the pleural cavity of small subpleural abscesses resulting from the liquefaction of consolidated portions of the lung. Moschcowitz (69), apparently unaware of Rosenbach's observation, draws a similar conclusion. He objects to the common view that empyema is due to infection by contiguity as this complication is not observed in infection of other serous cavities. Diffuse peritonitis seldom, if ever, results from acute appendicitis unless there has been perforation of the appendix or necrosis of its walls. Moreover, infection of the pleura by contiguity would presuppose a flow of lymph in a direction opposite to that demonstrated by physiologists and anatomists. In a large percentage of thirty-six autopsies Moschcowitz found subpleural abscesses perforating into the pleura.

As a rule the purulent fluid becomes encapsulated by the deposit of fibrin in the periphery of the cavity. These encapsulations may be single, multiple, localized, or diffuse. While a seropurulent pleurisy is always free, a purulent pleurisy is nearly always encapsulated. The bronchial fistula is due to the rupture of a subpleural abscess into the pleural cavity. Only in

rare instances is it secondary to rupture of the empyema cavity into the bronchial tree. When encapsulated pus occurs in thin sheets between the lobes, the condition is termed "interlobar empyema." This is the multiple encapsulated, loculated empyema. Dissecting pleurogenic pneumonia is formed in the interstitial tissue along the lymphatics.

Pathological changes in the pleura show considerable variation. Especially in pneumococcal empyema in children the pleura may present a normal smooth and glistening surface covered with a purulent exudate. As a rule, however, the surface is dull and finely granular, shows marked congestion of the blood vessels, and is covered with flakes of fibrin. In other cases there is a pseudo-membrane which strips off easily, leaving a smooth surface lined by endothelial cells. In still others the polyhedral endothelial cells may be degenerated or there may be degeneration of the sub-endothelial connective tissue, a change which may alter the character of the exudate. Lucke and Barker (70) are of the opinion that endothelial cells are the predominating type found in the exudate of influenza; these are not seen in pleuritis due to streptococci, pneumococci, or other organisms. He does not state whether they originate from the pleural surface or from the endothelial cells of blood vessels.

Graham (71) has shown by experiments that in the formation of pleural exudates the respiratory movements are of very great importance and that the largest amount of fluid is formed at the end of expiration.

It must be borne in mind that, in addition to the presence of associated lesions of the lungs and the purulent exudate, there is flattening of the diaphragm and a decrease in diaphragmatic movement due to partial paralysis. Barjin (72) has shown that this paralysis precedes the effusion and persists after its disappearance. It is not observed in cases of transudation such as the hydrothorax of Bright's disease, even though the amount of fluid is large.

The lesions of the lungs may be divided into the lobular, lobar, and interstitial bronchopneumonia. The term "interstitial bronchopneumonia" was introduced by MacCallum to designate a peculiar form following measles and usually associated with empyema. This condition was found in twenty-six of his thirty-seven autopsies. The lobar and lobular pneumonia presented the well-known textbook picture. Interstitial bronchopneumonia is described by Cole and MacCallum (73) as follows:

"Analysis of the cases appears to show fairly conclusively that the pneumococcus is responsible for those in which lobar pneumonia was found. The streptococcus hæmolyticus, in most instances, seems to cause a peculiar form of bronchopneumonia which, on account of its anatomical characters, I have designated 'interstitial bronchopneumonia.' There are, however, some cases in which this organism, growing in overwhelming numbers or with especial virulence, produces a patchy pneumonia of a type more closely resembling the familiar lobular or bronchopneumonia found so often as a terminal event in persons dying of some chronic disease, or in those in whom aspiration of infected material has occurred. This may be referred to as 'lobular pneumonia.'

"One of these infections may be superimposed on the other, and there may even be found lesions corresponding to each in the same lung.

"Fibrinopurulent pleurisy with abundant exudate has occurred with extreme frequency in these cases.

"The interstitial bronchopneumonia has been studied in various stages in different cases and found to produce extraordinarily different appearances as it progresses.

"In the earliest stage the pleural surface of the lung is smooth and glistening. The lung is in general air-containing, although atelectatic patches may be making their appearance. On section, small hæmorrhagic foci are found scattered through the lung, each showing, as a rule, a gray, rather opaque center. These foci measure from 2 to 3 millimeters in diameter, sometimes more, and are so small that several may occur in one of the secondary lobules of the lung, that is, in one of the lobules marked off by the interlobular septa (W. S. Miller). Microscopically, it is found that these foci represent the ends of the bronchioles together with the adjacent alveoli. The bronchiole and the ductus alveolaris are filled with leucocytes, among which streptococci are found in pairs or in short chains. There is some infiltration of the bronchiole wall with leucocytes, and the adjacent alveoli contain a few leucocytes, occasionally streptococci, coagulable fluid, and great numbers of red blood corpuscles. Not only the alveoli which form a continuation of the bronchiole, but also those which lie near its wall, seem to be affected.

"In a somewhat later stage the lung can still be distended with air, although the patches of collapsed lung are more extensive. On section it is found studded throughout large areas with small gray nodules which project above the cut surface like miliary tubercles and are often surrounded by a red or grayish halo. At this time

there may be visible a minute cavity or depression in the center of each, which marks the lumen of the bronchiole. This may be represented, however, by the opaque contents of the bronchiole. These nodules have been mistaken by more than one for miliary tubercles, and it seems conceivable that the peculiar appearance of this and later stages may be in part, at least, responsible for the almost universal statement that measles is commonly followed by tuberculosis.

"Fibrinopurulent pleurisy, often with excessive effusion of greenish, turbid fluid, accompanies the process from this stage on. In a still later stage the lung is usually much collapsed, dark blue, flabby, and airless except in the anterior portions. This is produced chiefly by the pressure of the pleural exudate, but partially by the occlusion of the bronchioles. At this stage shot-like nodules 3 or 4 millimeters in diameter may be felt all through the lung. On section, the pasty, airless lung sinks into a concave surface, leaving the gray peribronchial nodules projecting conspicuously as whitish-yellow lines marking out the whole lobulation of the lung into polygonal fields. In each of these fields there may be three or four projecting nodules which now usually show distinctly a central bronchial lumen. The surrounding tissue may be fairly dense, so that the peribronchial thickening is marked out chiefly by its opaque whiteness. Hæmorrhage may in some cases stain the outlying regions about the nodules. If the bronchi be opened with the scissors, they are found to be slightly dilated toward the periphery of the lung, where they become thick-walled as they run into the terminal portion which forms the center of the nodule. The contents are thick and glutinous.

"In still later stages, more extensive infiltration of the peribronchial tissue occurs, and solid yellow patches from 1 to 2 centimeters in diameter appear. The induration about these, with œdema and hæmorrhage, becomes confluent, so that quite large areas may appear consolidated. Septicæmia occurs only in the hours just before death, and in only one protracted case was there found an infarct-like lesion in the spleen. In all the others the abdominal organs were normal."

Other pathologists have reported extensive changes in the other organs. Lucke, Wight, and Kime (74) state that of 125 cases of influenza studied at autopsy the majority showed acute parenchymatous changes in the myocardium and other structures similar to those observed in other acute infectious diseases. Hamburger (75) states that parenchymatous degeneration and vacuolization of the myocardium occurred in the fatal cases. Symmers, Dinnerstein, and Frost (77) describe another picture found at autopsy in a group of influenza cases which resembled that of wood-alcohol poisoning, viz., an intense congestion of the viscera without evidences of pneumonic lesions or associated only with lesions which were so small as to be negligible. Death was accompanied by signs of asphyxia. Careful chemical analysis failed to reveal the presence of poisons.

In the recent epidemic the pathologic lesions were strikingly different. Symmers (76) records an extraordinary variety of pulmonic lesions which varied in the two lungs of the same case and in the lungs of different cases. Concomitant semipurulent pleural exudates were observed in 40 per cent of the cases, multiple pleural and subpleural abscesses in 44 per cent, and intrapulmonary abscesses in 35.5 per cent of all autopsies. There were extensive invasions of the interlobar and interlobular sections of the lungs, and it was not uncommon to find solitary, multiple, confluent, or discrete abscesses of the parenchyma. The presence of acute degenerative changes in the heart, liver, and kidneys was another striking difference in the recent epidemic. Blood cultures showed streptococci in 10 per cent of the cases, whereas in the pandemic these cultures were almost invariably sterile.

In chronic empyema the pleura varies in thickness from a few millimeters to 2 or 3 centimeters. Usually it is covered with granulation tissue and microscopically is composed of granulation tissue. Collections of polymorphonuclear leucocytes and areas of necrotic tissue surrounded by more mature fibroblasts and showing round-cell infiltration are frequently seen. Sections of pleura from cases in which zinc chloride has been employed show small necrotic areas surrounded by dense bands of connective tissue in which small round cells and plasma cells form an outer wall. Bacteria can be demonstrated in the necrotic area as well as in the outer zones. A large percentage of the pleuræ from chronic cases are tuberculous.

Osteomyelitis of the ribs is not an infrequent complication. Attempts at bone regeneration with bizarre extensions of processes and bridge formation between the ribs are often found. These osteophytes are due to chronic inflammation.

SYMPTOMS AND DIAGNOSIS

The diagnosis of empyema is made on the observations of the patient and his clinical chart, the physical signs, the roentgen-ray findings, and exploratory puncture. Frequently it can be made only by exploratory puncture. Gray (78)

states that in many cases diagnosed clinically as lobar pneumonia autopsy showed no evidence of pneumonic consolidation, but revealed instead large amounts of exudate or fluid with atelectasis of the lungs. The group of cases presenting the textbook symptoms offer no difficulty in the diagnosis. As a rule we find a decrease in respiratory movement on the affected side and bulging and increased fullness of the intercostal spaces. Vocal fremitus is absent. Percussion elicits flatness or marked dullness except at the apex above the fluid, where the note is almost tympanitic. On auscultation, the breath sounds are absent.

Thomas (79) describes a syndrome which he regards as pathognomonic of the rupture of an encapsulated empyema into the pleural cavity. During convalescence the patient feels a sudden sharp pain in the chest following slight exertion. In a few hours he becomes critically ill; the temperature rises to 102 to 104 degrees F., the pulse becomes rapid, and respiration, which is shallow and extremely painful, varies in rate between fifty and sixty per minute. The pain localizes in the lower part of the chest or in the abdomen. Distention with marked tympany extending well up over the liver, and general tenderness may be more marked on one side than on the other. The chest findings are not striking, but indicate the presence of a small amount of fluid. There is marked leucocytosis. Prostration is extreme. Thomas believes this remarkable reaction is due to the toxæmia resulting from the absorption of pus from the large serous surface rich in lymphatics.

In the influenza epidemic Reilly (80) noted an unusual syndrome consisting of paroxysmal attacks of pain on the right side at the level of the insertion of the diaphragm. In many instances this pain lasted about half an hour and returned at intervals of two or three hours throughout the day. Bierring, Luginbuhl, and Burt (81) record a severe infection affecting eight members of one family and causing seven deaths. Three of these persons developed empyema.

Mention should be made of pulsating empyema, first described by MacDonnell. This is of two types, viz., the intrapleural pulsating empyema and the "pulsating empyema necessitatis" in which there is an external pulsation. The pulsations are due to the heart impulse, but no satisfactory explanation of the mechanism of transmission of the beats has been offered.

Wessler (82) subdivided encapsulated empyema into four types: the parietal, diaphragmatic, and interlobar, and an encapsulation between the lung and mediastinum. Peskund (83) describes an interlobar empyema which apparently followed latent pneumonia.

Empyema may perforate any of the thoracic viscera or extend to the external surface through a fistula opening at some distance from the pleural cavity. Foot (84) reports a case in which there was a communication with the psoas muscle. Meigs (85) had a case with a fistulous opening at the umbilicus. These more rare complications are included in the discussion of the diagnosis as they may be encountered as persistent sinuses and their true nature can be determined only by means of the X-ray with the injection of bismuth.

The X-ray is a valuable aid in the early diagnosis of empyema. Nims (86) observed that free collections of pus in the pleural cavity are usually preceded by small collections between the lobes. Manson (59) found the roentgen ray of value when the quantity of pus was 500 cubic centimeters or more, in which case the rib shadows are obliterated and the costodiaphragmatic angle is obscured. Contrary to accepted teachings, the shadow cast by thick pus is lighter than that cast by serous fluids and at times it is difficult to state from the plates whether or not pus is present. Shadows due to sanguinous fluid are relatively dense.

Miller and Lusk (87) found that the X-ray is of less value in the differentiation of pus from consolidation, but gives accurate data regarding lobe involvement. Diemer (88) emphasizes the value of the X-ray in the diagnosis of interlobar empyema, which is often very difficult to detect in the routine physical examination. Stewart (89) has pointed out that early effusions appear in the axillary space and stand out in the outer zone of the chest cavity as ribbon-like shadows with a sharp inner border. Davis (90) concludes from a study of 1,000 cases that it is impossible to distinguish small amounts of fluid from consolidations of lung tissue. He points out also that as a rule the diaphragm is higher and more fixed on the involved side than on the non-pathologic side.

Lambert (91) emphasizes the necessity for a careful X-ray study of the cavities of chronic empyema before treatment is undertaken. This is best accomplished by injecting a semi-solid or fluid substance which is opaque to the roentgen ray and is not injurious. Stevens (92) advocates the use of thorium nitrate, but in large cavities this may give rise to unpleasant reactions and hæmaturia. Beck (93) concludes from his experience in a large series of cases of empyema that there is no danger in the use of his paste if

the proper technique is employed. He does not agree with the statement that bismuth separates out of the suspension during the X-ray examination. The writer has seen Beck inject a large series of empyemata without causing any unfavorable after-effects.

While the roentgen ray is of a great aid in the study of empyema, the value of a large-gauge exploratory needle should not be forgotten.

COMPLICATIONS

The chief complications of empyema are sepsis and perforation. Perforation into a bronchus is indicated by an attack of violent coughing during which almost pure pus is expelled. The perforation or rupture of encapsulated empyema into the general pleural cavity has already been discussed with the symptoms.

Sudden death may result from too rapid evacuation of the pleural contents and from injections of fluid in the chest cavity. In the latter case it is due to a pleuro-cardiac reflex (vagus). In very rare instances temporary blindness may follow injections of bismuth compounds. The writer observed this once in a series of more than 200 cases, when the injection was made into a very large cavity. Apparently an embolus was formed. The patient recovered completely in about ten days.

PROGNOSIS

It may be well to analyze the term "prognosis" before discussing the statistics. The prognosis is the prediction of the course of a disease. It is possible to make a prognosis only when we have exact knowledge of the disease itself, the condition of the diseased body, and the influence of treatment. It is obvious, then, that statistics on empyema are of only academic value. If it were possible to standardize the methods of treatment and to agree as to the exact nature of empyema, it would still be necessary to group the patients into numerous subdivisions on the basis of their resistance.

This can be fully appreciated when we study the report of Graham (94) to the Surgeon General of the United States Army on empyema in the base hospitals, a report compiled from a questionnaire sent to the principal base and general hospitals. The average mortality in twenty-five camps was 30.2 per cent. In those hospitals in which immediate drainage was advocated, it was 31.8 per cent, while in those in which drainage was delayed (aspiration only being done), it was 31.6 per cent. The mortality of simple thoracotomy was 39.4 per cent and that of rib resection 31.3 per cent. High as these figures are, however, they do not approach the remarkably high death rate in some of the camps. At Camp Funston the mortality was 84 per cent; at Camp Green, 57 per cent; at Camp Wheeler, 65 per cent; and at Camp Doniphan, 57 per cent. Graham attributes the striking differences between the various camps to the fact that there was marked disagreement as to the condition diagnosed as empyema and as to the method of treatment. The exudates varied from a slight turbid, serofibrinous "dishwater" fluid with pus demonstrable only microscopically to frank pus recognizable on macroscopic examination. In general, the camps which reported the lowest mortality regarded as cases of empyema only those in which the exudate was frank pus. Conversely, the highest mortality was that of camps in which all cases showing even microscopic pus in the pleural cavity were considered empyema cases.

If we include these borderline cases of pneumonia in the pandemic, the prognosis of empyema must be classed with that of bubonic plague and virulent smallpox.

Leyva and Legendre (95) state that the prognosis of empyema should be based, not on the nature of the fluid or the organism found, but on the condition of the pneumonic processes.

Miller and Lusk (87) have classified patients with streptococcal empyema into three groups:

1. Those who die early from acute toxæmia whatever treatment is given.

2. Those with multiple pus foci. Death always results in such cases because it is impossible to detect and drain all of the foci.

3. Those with moderate toxæmia and localized pus, who usually recover after early operation or aspiration followed by operation.

Clendening (96) has tried early operation, aspiration, and the let-alone policy in the treatment of streptococcus empyema and has found that the results are about the same in the three groups. According to Hahn (97), the mortality from the various German clinics varies from 8 to 25 per cent. Lavrow (98) gives a mortality of 55 per cent for all cases, and 45 per cent for those of adults alone. Holt (99) reports a mortality of 73 per cent for children under 1 year, and of 58 per cent for those under 2 years. Wilensky (100) reports a series of 299 consecutive cases from the years 1904 to 1914 in which the mortality was 28 per cent.

In cases studied by Gray (78) the mortality was 41 per cent when the empyema developed the first week, 26 per cent when it developed the second week, and only 7 per cent when it de-

veloped later than the second week. In cases treated surgically the mortality was 21 per cent, while in those not operated upon (not including cases operated upon late) it was 74 per cent.

The prognosis of infected hæmothorax depends upon the nature of the wound, the causative factors, and the organisms in the clot. In a study of 450 cases Hutchison (101) found that bullet wounds were less serious than other gunshot wounds. Infection occurred in about one-fourth of the shell wounds in which the missile was not retained and in about one-half of these in which the missile was retained. In another communication Hutchison (102) states that in cases in which the wound was closed tight the mortality was less than in those with open chest wounds. Lockwood and Nixon (103) noted that if the diaphragm was injured and not repaired the patient died. This was true also in cases of extensive injuries of the bony skeleton if the comminuted ribs and spicules were not removed.

Tuberculous empyema is usually a complication of pulmonary tuberculosis, frequently developing in its advanced stages. It is obvious then that the prognosis is grave. McKinnie (104) reports on twenty-eight cases of tuberculous empyema with mixed infections. Eight of these were treated by aspiration and twenty by open drainage. Of the patients operated upon, nine died, one recovered, and the rest are chronic invalids. Letulle (105) also concludes that the prognosis of tuberculous empyema is very unfavorable.

According to Stevens (107), recurrences of empyema developed after operation in fourteen (25 per cent) of fifty-six cases reported by the Empyema Commission (106) as having healed under simple drainage, and in eight (12 per cent) of sixty-seven cases which healed under Carrel-Dakin treatment.

From these statistics we must conclude that empyema requires considerable future study and can no longer be looked upon as a closed chapter in surgery.

PROPHYLAXIS

The difficulties of prophylaxis in empyema are exceedingly great on account of the large number of factors which may cause this condition.

In advocating the use of a mixed vaccine of pneumococcus, hæmolytic streptococcus, staphylococcus, and influenza bacillus for the prevention of influenza, Rosenow (108) stated that only twenty-eight of 481 persons on whom this vaccine was used developed influenza. Cecil and Austin (109), who have given a pneumococcus vaccine to 13,460 troops, report that the cases of pneumonia among vaccinated troops were less than half those among unvaccinated troops. Vaughan (49) states that vaccines have proved of no value whatever in influenza. The cases of influenza in the pandemic showed a leucopænia, while infection with Pfeiffer's bacillus caused a leucocytosis. It is doubtful whether the etiological factor of influenza is known. Gay (110) was unable to demonstrate any value in vaccines in empyema produced experimentally in rabbits.

According to McCoy (111), the uncontrolled use of vaccines has led to the general impression that they are of value in influenza, but in every case in which they have been tried under perfectly controlled conditions they have failed to influence definitely either the morbidity or the mortality.

McCoy, Murray, and Teeter (112) studied two groups of 390 persons. In the vaccinated group 119 developed influenza, twenty-three developed pneumonia, and ten died. In the unvaccinated group there were 103 cases of influenza, seventeen cases of pneumonia, and seven deaths.

A commission (113) appointed to study vaccine therapy found that it was of no specific value in influenza but also that it had no unfavorable results.

TREATMENT

As a rule empyema is a complication of some other disease. It should be borne in mind, therefore, that the associated morbid process (pneumonia) requires appropriate treatment. It is obvious that the treatment of empyema should be secondary to the treatment of a massive active pneumonia. Failure to recognize this basic fact was responsible for the appalling mortality during the pandemic of influenza. Curative treatment for the empyema should be begun only with the subsidence of the active associated lesions. Hygienic measures, nursing, diet, and routine measures are indicated as in any other acute illness. For convenience of description the methods of treatment are described in the following order:

I. Non-operative: aspiration, dyes, chemicals.

II. Operative: anæsthesia, pneumothorax, shock.

1. Acute empyema.
2. Chronic non-tuberculous.
3. Tuberculous.

The term "non-operative" is used here to include all methods of non-surgical intervention except aspiration. Major (114) reports twenty-seven cases treated by aspiration and the injection of gentian violet into the pleural cavity. There

were fourteen cures and eight failures. The bactericidal properties of gentian violet have been determined by Churchman (115). Émile-Weil and Loiseleur (116) employed a similar method except that they injected methylene blue and air into the pleural cavity. Ultimately seven of the twelve cases came to operation. After careful experimental study, Gay and Morrison (117) have come to the conclusion that there is little certainty of the ultimate usefulness of dyestuffs as disinfectants in bacterial infections. Sherrill (118) advocates the old method of injecting a 2 per cent solution of formalin in glycerin, and reports a decrease in the mortality at Camp Sherman from 50 per cent to 5 per cent. In a later communication on the end-results in these cases Dodge (119) reports that of the fifteen patients reported cured four were lost sight of and the remaining eleven were re-admitted to the hospital within a few weeks for subsequent operation. Manson (120) reports on forty-three cases treated by repeated aspiration and the injection of a 2 per cent formalin solution in glycerin, but was unable to cite a single cure obtained by this method alone. It is a matter of common knowledge that a marked œdema follows the injection of formalin into the tissues. Diederich (18) employs a method which may be classed as a borderline non-operative measure as defined in this section and very similar to the method recommended by Williams (17).

The lack of concrete knowledge of the pathology of empyema has given an impetus to the development of special methods of treatment. There are some instances in which simple aspiration or aspiration with the injection of an antiseptic into the pus pocket will lead to a cure, but the number of cures obtained by this method is so small as compared with that of other recognized procedures, and the chances of producing a chronic condition with permanent secondary changes in other organs (amyloid degeneration) is so great, that such new ventures cannot be condemned too strongly.

OPERATIVE PROCEDURES

Anæsthesia. As a rule local anæsthesia (121) should be employed in all extrapleural operations. Bartlett (122) concludes that in the near future it will be necessary to establish rules for the use of general and local anæsthesia. For major intrapleural operations general anæsthesia is indicated, but it must be remembered that the anæsthetic may add to the existing pathologic chest condition. From a careful analysis of the statistics, Cutler (123) has found that one patient in every thirty to fifty operated on develops a pulmonary complication regardless of the anæsthetic used, and one patient in every 150 to 175 dies from such a complication. The presence of sepsis is a factor. Armstrong (124) has shown that in thirty-five of fifty-five cases in which a lung complication developed there was a septic focus in some part of the body. Herb (125) reports remarkable results with ether anæsthesia properly induced. For major thoracic surgery, Lilienthal (138) prefers the intratracheal administration of ether. Gwathmey (127) concurs with the statement that magnesium sulphate enhances the action of morphine. One-eighth of a grain of morphine in 1 or 2 cubic centimeters of a 25 per cent of magnesium sulphate will relieve pain from ten to thirty hours instead of from two to four hours as is the case when it is given in sterile water. It also relieves shock which is such an important factor in thoracic surgery. Crile and Lower (128) ascribes shock to exhaustion of the central nervous system. Dale (129) has shown experimentally that chloroform causes the greatest degree of shock, ether the next greatest, and nitrous oxide the minimum degree.

Pneumothorax. Lenhart (130) has shown by careful experiments that open pneumothorax impairs the gaseous exchange in the lungs, increases the carbon dioxide content and the hydrogen-ion concentration of the blood, and reduces the respiratory quotient. Graham and Bell (131) have proved erroneous the common belief that when there is collapse of one lung in a unilateral open pneumothorax normal respiration is maintained in the other lung. It has been shown also that bilateral open pneumothorax in the normal chest is no more dangerous to life than unilateral pneumothorax, provided the total open area on the two sides is not larger than the area of one opening. It is evident, then, that the pleural cavities must be considered as one sac. Only in old chronic cases, in which the mediastinal pleura is very much thickened, may the two sides be considered somewhat independent. Graham (132) has shown also that theoretically an opening 5 by 10 centimeters in size is the largest for which compensation can be established in man. Mayer (133) concludes that the modification due to a small opening in the chest wall is compensated by deviation of the mediastinum. Sauerbruch (134), a strong advocate of closed thoracic surgery, has shown that open pneumothorax causes a fall of 2 degrees in heat after the opening of the chest wall, increases the danger of infection, and results in marked disturbances in the circulation. Norris (135) states that dyspnœa is due to imperfect alveolar ventilation of the sound lung. According

to Stivelman and Rosenblatt (136), the accumulation of fluid in the pleural cavity is induced by therapeutic pneumothorax.

It is evident from this research that open pneumothorax affects the opposite lung if firm adhesions are not present or if the mediastinal pleura is not thickened and accustomed to the changes in pressure.

On the basis of treatment, Moschcowitz (69) divides acute empyema into three stages: the formative, the acute, and the chronic stage. In the formative stage the more important conditions demanding treatment are the toxæmias, active pneumonia, and extensive pleural exudates. It is obvious that the treatment of the empyema itself should be only palliative. Palliation is best obtained by simple aspiration relieving the compression of the lung.

Stone, Phillips, and Bliss (137) have shown that the mortality was 63.8 per cent in eighty-three cases without preliminary aspiration and 22.2 per cent in cases with deferred operation preceded by aspiration. Stone (64) reports the results of 310 cases; in eighty-five cases operated upon early the mortality was 61.2 per cent, and in ninety-four treated by early aspiration and late operation it was 9.5 per cent.

In the formative stage, aspiration alone is indicated. Further meddlesome surgery will only increase the mortality rate.

In the acute stage the pus is walled off, and the treatment is that of any other abscess.

There seems to be general agreement among surgeons that early aspiration followed by late operation is the method *par excellence*. Lilienthal (138), Aschner (139), McKenna (140), Ashurst (141), Ransohoff (142), and many others agree that this procedure gives the best results. The chief point of variance is whether the open or the closed method is indicated. Even if the closed method is employed, there is a leakage of air into the pleural cavity after a period of a week or more. Mozingo (143), Philips (144), Delbet and Girode (145) and many others claim to have had the most excellent results with the closed method. The use of antiseptics in the thoracic cavity is another disputed point.

While a great many good surgeons have reported very excellent results from the use of Dakin's solution (146), acriflavine (147), proflavine (148), crystal violet, and gentian violet (115), there is another group (Moynihan, Leishman, Burghard, and Wright, 149), who believe that the treatment of suppurative wounds by means of antiseptics is "illusory reasoning."

In 1915 Sir Almroth Wright (150) stated that an antiseptic if ever sterilized a heavily infected wound it would be a matter to announce in all the evening and morning papers. While there is no doubt that it is possible to sterilize the surface of empyema cavities by the Carrel-Dakin method (151), the writer is convinced by his experience with this procedure in over 200 cases that it is impossible to sterilize the deeper underlying structures as microörganisms have been demonstrated in the thickened walls removed from empyema cavities so treated.

Excellent results from thoracotomy and rib resection have been reported. On anatomical and physiological grounds (distribution of lymphatics) it appears that rib resection should be the method of choice. The mortality rate as reported by Graham to the Surgeon General is less following rib resection (31.3 per cent) than following thoracotomy (39.4 per cent).

Healing is prevented in empyema by many factors such as foreign bodies (fragments of missiles, and especially lost drainage tubes), incompletely drained simple or multilocular pus pockets, and osteitis of the ribs. Gibbon (152) concludes that if the cavity is thoroughly sterilized it may be sutured and the lung will gradually obliterate it. Petit (153) reports six cases successfully treated by this method after an old sequestrum of the ribs had been excised. Tuffier (154) reports forty-seven successful results from secondary suture after sterilization of the cavity and decortication of the lung. Stoney (155) limits his treatment to sterilization of the cavity and secondary suture.

Delorme (156) classifies chronic empyema cases into three groups: (1) those in which there is no fever and the general condition is good; (2) those poorly drained and febrile; and (3) those with bronchial fistula. In the latter two groups a pleurotomy is performed to bring the temperature to normal, and in a subsequent operation the thickened pleura is removed to allow expansion of the lung. Lilienthal (157) suggests decortication with non-collapsing thoracoplasty which he accomplishes by separating the ribs with a special retractor. He advises immobilization of the lungs if necessary.

Other operations for the treatment of chronic empyema are based on the principle that if the lung cannot be liberated and caused to expand, it is necessary to bring the chest wall to it. The two most important operations of this class are the Estlander (158) and Schede (159) operations. The so-called Estlander operation was first performed by Warren Stone, an American surgeon (New Orleans, La.) in 1873, six years before

Estlander popularized it (Estlander's publication, 1879).

Beck claims to have succeeded in curing a number of empyema cases with his paste. For the more resisting cases he has devised a skin-sliding method in which an attempt is made to line the cavity with skin flaps (160).

Tuberculous empyema has been discussed in part in this review under "Prognosis." Fowler (161) recognized the fact that surgery is unsatisfactory in tuberculosis as it invariably results in a permanent fistula with secondary infection of the chest cavity. As tuberculous empyema is a complication of pulmonary tuberculosis, frequently of the advanced stages of the latter condition, it goes without saying that the results of surgical treatment are never promising. Beck's paste may be valuable. As a rule antiseptics are practically useless.

CONCLUSIONS

1. In the early stages of exudative pleuritis the associated pneumonic processes are the most important and should receive appropriate treatment. If the indications warrant, aspiration may be done during the first week. Hygienic measures, good nursing, and proper diet are of the greatest importance.

2. When the exudate has become frank pus, the pneumonic processes have subsided, and there has been general improvement in the patient's condition, rib resection is indicated.

3. Before the operation the patient should be given a fluoroscopic examination and X-ray plates should be made to determine the most favorable site for the incision.

4. Proper drainage is the most important factor in the treatment. Antiseptics may be employed, but they never supplant good common sense and good surgical principles.

5. Negative pressure greater than −10 millimeters is probably just as harmful as positive pressure.

6. A thorough study of the case and stereoscopic plates should be made before any operative procedure is undertaken. The removal of a foreign body, such as a lost drainage tube, or the improvement of drainage may be all that is necessary for cure.

7. Decortication without mutilation of the chest wall is indicated in old chronic empyemata which have resisted all simpler means of treatment. The Ransohoff discission of the pleura is often followed by good results.

8. Open operations on tuberculous empyema are not followed by good results. On account of the associated pulmonary lesions, nice judgment may indicate non-interference.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

ANÆSTHESIA

Druener, L.: Conduction Anæsthesia in the Leg (Ueber Leitungsanaesthesie am Bein). *Zentralbl. f. Chir.*, 1922, xlix, 1276.

Druener exposes the sciatic nerve with 10 c.cm. of a 0.25 per cent solution of novocaine and anæsthesizes it with 10 c.cm. of a 1 per cent solution of novocaine. At a second operation the femoral nerve is exposed with the same amounts of the same solutions. The obturator nerve is charged with 10 c.cm. of a 1 per cent solution through the wound. The lateral cutaneous femoral nerve is infiltrated through the skin with 10 to 20 c.cm. of a 0.25 per cent novocaine solution. Anæsthetization of the ilio-inguinal and iliohypogastric nerves may also be necessary.

Druener has induced anæsthesia in thirty-three cases in this manner, but he does not consider his technique any better than the Schleich and Crile methods. The Wiedhopf procedure is dangerous because of the excessively large dosage used.

KULENKAMPF (Z).

Koenig, F.: Experiences in 600 Cases of Local and Conduction Anæsthesia (Erfahrungen an 600 Fallen von Lokal- und Leitungsanaesthesie). *Deutsche Ztschr. f. Chir.*, 1922, clxxii, 287.

For injection anæsthesia, as the author designates local analgesia and lumbar anæsthesia, novocaine-B tablets are used at the Wuerzburg clinic. Tropocaine is employed only for lumbar anæsthesia. The question as to the best dosage of novocaine is still undecided.

In the 600 cases reviewed there were only twenty-six failures (4.3 per cent). These included lumbar, paravertebral and parasacral anæsthesia, and splanchnic anæsthesia induced by the technique of Kappis or Mulley. When induced on the proper indications and with a correct technique, injection anæsthesia will take the place of general anæsthesia.

In discussing its dangers Koenig states that considerable cardiac and circulatory disturbance was present in twenty-seven cases (4.5 per cent). In cases of lumbar and paravertebral anæsthesia there were two deaths, but in the author's opinion these could not be attributed to the procedure. Slighter cardiac symptoms appeared in 139 cases. Marked respiratory disturbances occurred once when the Mulley technique was used and once in paravertebral anæsthesia with temporary arrest of respiration. In fifteen cases, seven of which were those of children, there was marked excitation. Vomiting occurred in twenty-two cases (five times in abdominal operations). Vertigo, headache, and sweating were sequelæ in twenty-one cases. In one case of struma in which paravertebral anæsthesia was induced there was collapse with Cheyne-Stokes breathing but the patient recovered. In certain cases of arteriosclerosis and operations for hernia secondary hæmorrhage occurred. Plexus anæsthesia was occasionally followed by long-continued paralysis.

Conduction anæsthesia causes less shock than general anæsthesia. Only thirteen patients left the operating table in very poor condition, and of fifty who had been subjected to an extensive gastric operation only three were in poor condition. Aspiration is avoided. The resulting local anæmia simplifies operations on the skull and lower jaw, and goiter operations. The injection and circumjection are harmless, being comparable to the first stage of ether and ethyl-chloride anæsthesia. Anæsthesia of the trigeminal nerve and the nerves of the extremities is quite harmless, but in paravertebral, plexus, and splanchnic anæsthesia there is danger of intoxication and secondary injuries. Lumbar anæsthesia is applicable only in diseases threatening life.

KULENKAMPF (Z).

Jonnesco, T.: A New Technique for General Spinal Anæsthesia (Nouvelle technique de la rachianesthésie générale). *Presse méd.*, Par., 1922, xxx, 929.

Since 1908, a total of 5,016 operations (1,136 high and 3,880 low) have been performed in Jonnesco's clinic under spinal anæsthesia without any deaths and without any severe immediate or late complications. To these Jonnesco adds similar operations by others, which brings the total to 11,324 operations (1,035 high and 10,289 low) with only two fatalities.

Jonnesco is convinced that, as the result of the new technique he describes in this article, general spinal anæsthesia will soon become the method of choice. It is applicable to all cases and operations. It is simple and easy, and demands no previous preparation of the patient. The equipment required consists of only a fine 6-cm. needle, a hypodermic injection syringe, and an ampulla containing the anæsthetic solution. The spinal puncture, high or low, is made very easily. The method is rapid since the puncture can be made and anæsthesia follows in about five minutes. Apart from its technical advantages, spinal general anæsthesia has also the advantage of precision as it is regional and segmental and its effects can be limited to the nerve roots selected with almost mathematical exactness.

The first change made by Jonnesco in his original method was the addition of strychnine to stovaine. Since 1921 he has added caffeine also, but since May, 1922, has omitted the strychnine and doubled the caffeine. The employment of the new mixture has necessarily modified the technique slightly, and in certain types of operation the puncture point has been changed. W. A. BRENNAN.

Scholl, A. J., Jr.: Further Experiences in Sacral Anæsthesia in Urology. *California State J. M.*, 1922, xx, 425.

There are two common methods of anæsthetizing the sacral nerves, viz., the injection of novocaine solution into the main central canal through the caudal foramen, and the individual injection of each nerve as it leaves the lateral sacral foramen.

The caudal injection is satisfactory for most operations on the perineum or external genitalia, and for practically all endovesical procedures. A single caudal injection, however, requires twenty minutes to induce complete anæsthesia. A further disadvantage of the method is that in from 10 to 15 per cent of the cases the resulting anæsthesia is not complete.

When the lateral nerves are injected individually there is almost immediate anæsthesia of the area involved and failures are unusual, but it is much more difficult to inject the nerves as they leave the canal than to make the single caudal injection, and the contact of the needle against the periosteum or the occasional striking of the nerve causes pain.

In discussing his technique Scholl states that the novocaine solution is prepared fresh for each case. As a rule, 30 c.cm. of a 2 per cent solution of novocaine bicarbonate solution are used. In the cases of children and adults with reduced vitality the dose is decreased. The most satisfactory results have been obtained with Metz novocaine; this is kept in powders with enough sodium bicarbonate to make 30 c.cm. of a 2 per cent solution: sodium bicarbonate, 0.15 gm., sodium chloride 0.1 gm., and novocaine 0.6 gm.

Caudal injections give very satisfactory anæsthesia for urological examinations and treatment. The wall of the bladder is completely relaxed and the bladder distended. Such relaxation with absence of pain and straining permits the operator to carry out a thorough unhurried examination of the bladder and ureters.

In certain conditions, such as severe cystitis and pyelonephritis, caudal injections have been given in order to facilitate lavage of the renal pelvis. In one case ten such injections were given in seven weeks.

The reaction following cystoscopy in severe cases of cystitis is frequently due to voluntary muscle spasm around the cystoscope, especially in the region of the neck of the bladder; this does not occur after sacral anæsthesia. In a number of cases of pyelonephritis and severe cystitis in which periodic renal lavage was given the treatment was at first carried out under caudal anæsthesia but later merely with urethral cocainization. The convalescence in these cases was invariably much smoother and easier when caudal anæsthesia was used. In several instances, patients refused to submit to cystoscopy without caudal anæsthesia. LOUIS GROSS, M.D.

Wideroe, S., and Dahlstroem, S.: The Dangers of Lumbar Anæsthesia (Les dangers de l'anesthésie lombaire). *Acta chir. scand.*, 1922, lv, 27.

A review of the literature on intraspinal lumbar anæsthesia reveals the fact that of all the dangers associated with the method, respiratory paralysis is the most common and most frequently fatal. Such a paralysis may occur immediately after the injection or hours or days later.

Air or various dyes injected into the spinal canal in the lumbar area reach the cerebral ventricular system within a few minutes. The authors believe that the drug injected for anæsthesia reaches the fourth ventricle and produces a depressant effect upon the respiratory center. LOYAL E. DAVIS, M.D.

SURGERY OF THE HEAD AND NECK

HEAD

Zebrowski, A.: Malignant Tumor of the Temporal Bone. *Ann. Otol., Rhinol. & Laryngol.*, 1922, xxxi, 739.

Malignant tumors of the temporal bone are exceedingly rare. The author has had three such cases. In the third case a radical mastoid operation was performed for chronic otitis media and mastoiditis with rapid growth of the tumor and subsequent death. The history of this case is reported in detail.

At autopsy a diagnosis of cancroid originating in the epidermis of the middle ear was made. Metastasis was limited to the glands in the immediate vicinity of the temporal bone.

In none of the cases reported by the author was a radical mastoid operation successful, and only two cases reported in the literature were cured by this procedure.

Early total resection of the temporal bone, including the pyramid, has been performed in three cases, a successful result being obtained in one. The most difficult step in this procedure is the freeing of the dura.

The author recommends a radical mastoid operation with ligation of the carotid artery and the jugular veins and removal of the glands to be followed several days later by a second operation for the removal of the entire temporal bone. MARCUS H. HOBART, M.D.

Sachs, B.: Shall We Decompress for Choked Disk? *Arch. Neurol. & Psychiat.*, 1922, viii, 515.

Of late years Sachs has lost faith in the efficacy of decompression for choked disk.

One hundred and forty brain tumors were studied. Of these, forty-five were completely unlocalized and ninety-five localized during the period of examination. The table shows the relationship of choked disk to the site of the tumor.

CHOKED DISK IN VARIOUS INTRACRANIAL TUMORS

Site	Number of cases	Choked disk	No choked disk
Cerebellum	29	25	3
Hypophysis	13	1	12
Frontal lobe	10	6	4
Temporosphenoidal area	10	9	1
Cerebellopontile angle	8	4	4
Parietal lobe	4	3	1
Parieto-occipital area	6	4	2
Right hemisphere	2	1	1
Left hemisphere	5	4	1
Third ventricle	2	2	—
Fourth ventricle	2	2	—
Lateral ventricle	1	1	—
Pons	2	—	2
Pineal body	1	1	—
	—	—	—
Total	95	64	31

In a series of thirty-eight cases decompression was performed for the relief of choked disk. In seven cases the site of the tumor remained wholly unknown. Twenty-nine cases showed no recession of the condition during prolonged observation. In four cases there was distinct improvement. Five cases showed slight recession. In five of the twenty-nine cases showing no recession optic atrophy resulted. In the others, optic atrophy may have developed at a later period. There may be some satisfaction if any vision is retained, but this does not prove that decompression promotes recession of choked disk.

When the presence of a tumor of the cerebellum or the cerebellopontile angle was suspected the suboccipital region was chosen for the decompression.

Choked disk does not necessarily indicate the presence of a neoplasm of the brain, and sometimes it recedes spontaneously.

CARL R. STEINKE, M.D.

Gordon, A.: Unusual Paucity of Symptoms in Some Cases of Pontocerebellar Tumors. *Arch. Int. Med.*, 1922, xxx, 606.

Special localizing symptoms of neoplasms developing in the pontocerebellar angle are described in detail and seven cases are reported in which the symptoms were vague until late in the course of the pathologic condition. The article contains also illustrations of the seven brains.

In five of the seven cases the increased intracranial pressure failed to produce changes in the ocular fundi. In the two positive cases the changes appeared only a short time before death. A positive sign common to all was an error in the pointing reaction. In four cases the head was inclined toward the side of the tumor, and when an attempt was made to move it to the opposite side the patient complained of headache and dizziness. Nerve involvement was noted in only two cases. Six of the patients had a negative Bárány test.

CARL R. STEINKE, M.D.

Dickie, J. K. M.: A Contribution to the Study of Brain Abscess. *Ann. Otol., Rhinol. & Laryngol.*, 1922, xxxi, 685.

The author reviews sixty-seven cases of otogenic brain abscess collected from the literature and reports a case of cerebellar encephalitis and a case of temporosphenoidal abscess.

From 1914 to 1918 in the Edinburgh Infirmary the frequency of brain abscess associated with otitis media was 0.38 per cent. Intracranial complications occur more than twice as often in chronic otitis media as in the acute condition.

The infection is introduced by direct extension through the tegmen tympani, which is the most common route in cases of temporosphenoidal abscess, or by small septic emboli in the blood.

In about half the cases of temporosphenoidal abscess there were no complications, but in those of cerebellar abscess complications were absent in only three of seventeen.

The number of the cases in which the condition followed an injury to the head or a mastoid operation suggests that trauma may be an etiological factor. In certain cases, however, abscesses have disappeared after a mastoid operation.

There is no one symptom of brain abscess that is constant or pathognomonic, and seldom are more than a few of the symptoms present in any one case. Three phases are generally noted: (1) an initial stage of encephalitis, (2) a middle stage of cerebral pressure, and (3) a terminal stage of coma. Some of the more important or common symptoms are chill; headache (present in fifty of sixty-seven cases); mental disturbances of various kinds; drowsiness (only in the second and final stages); vomiting (chiefly in the first two stages); nausea (generally absent in cerebral abscess but sometimes present in cerebellar abscess); obstinate constipation, particularly when the pressure becomes great; optic neuritis (occasionally present in cases with pressure lasting a fortnight or more); pupillary changes; a subnormal pulse; respiratory changes; leucocytosis; increased cerebrospinal fluid pressure; and localized pain noted in tapping over the region of the abscess.

Temporosphenoidal abscess may also show localizing symptoms such as paralysis of the opposite side, convulsions, and aphasia.

Cerebellar abscess has many more localizing signs than temporosphenoidal abscess. Among these are nystagmus, vertigo, lack of muscular tone, intention tremor, repeated yawning, and rigidity of the masseters.

The case of cerebellar encephalitis reported was that of a boy of 17 years who had had a draining

ear all his life. Mastoiditis developed some time after a blow on the ear followed by exposure to a cold wind five days later. Operations on the mastoid and cerebellar region resulted in complete recovery.

In the case of temporosphenoidal abscess the condition was due to chronic otitis media. Operation was followed by death. Autopsy revealed a large abscess.

In conclusion the author states that brain abscesses can be detected by repeated careful neurological examinations and that every patient should be given such an examination before he is subjected to a radical mastoid operation.

MARCUS H. HOBART, M.D.

New, G. B.: The Delayed Pedicle Flap in Plastic Surgery of the Face and Neck. *Minnesota Med.*, 1922, v, 721.

The pedicled flap found most satisfactory by New is the so-called "delayed flap" which he first saw used by Blair. Davis claims that Croft first advocated the application of this flap. It was employed also by Tagliacozzi.

The delayed flap is outlined and elevated from the surrounding tissue as if it were to be transferred, but is then returned to the wound and resutured in its original bed. The sutures are separated sufficiently to allow oozing between them. Firm pressure is applied by means of gauze and adhesive plaster for at least a week to hold the flap in place and to prevent the collection of blood or serum under it.

If the length of the flap makes the blood supply to the distal end questionable, the flap may be left attached at both ends and the distal pedicle cut off in a week or ten days. The cutting of the pedicle should be done a little at a time rather than all at once. In ten days or two weeks from the time the flap is first elevated it may be transferred to the defect. This is readily accomplished without anæsthesia, the area around the defect alone requiring cocainization. Although the method necessitates an additional step in the operation, it insures the blood supply and usually prevents the loss of any of the distal end of the flap.

The use of the delayed flap is recommended by the author also for the closure of non-operative openings in the palate and for the closure of wide cleft palate.

Where the delayed flap is transferred the skin is thin and flattened like normal skin. Therefore the dissection of a core of the tissue as in the tubed flap of Gillies is unnecessary. If a double epithelized flap is required to fill a defect in the nose or cheek, a Thiersch graft, with its raw surface up, may be placed in the wound where the flap has been elevated. In suturing the flap the needle is passed first through the flap, then through the Thiersch graft, and then through the margin of the skin.

The results of this method of treatment are shown by several illustrations.

NECK

Dubs, J.: Clinical Experiences in 840 Operations for Goiter, with Special Consideration of Recurrent Goiters and Operations for Recurrence (Klinische Erfahrungen bei 840 Kropfoperationen, mit besonderer Beruecksichtigung der Kropf-Rezidive und Rezidiv-Operationen). *Schweiz. med. Wchnschr.*, 1922, lii, 901, 931.

The author set himself the laborious task of going through the goiter material of the Kantonspital Winterthur for the years 1914 to 1921. During this time, 844 patients were operated on. In the first half of the period the unilateral operation was practiced almost exclusively, but in the succeeding years the bilateral procedure was done with increasing frequency (511 unilateral and 258 bilateral operations.)

For anæsthesia, the second Kulenkampff modification was used with the best results. In 260 strumectomies the wound was completely closed without drainage and in these cases there was less disturbance of wound healing than in the drained cases. If a sufficient capsular covering of the stump of the parenchyma cannot be achieved, the previously described muscle covering is used. This prevents not only the formation of a hæmatoma but also the formation of serum.

The author saw hemiaplasia of the thyroid gland in only seven cases. In one case cachexia thyreopriva followed an operation performed by another surgeon. One case of postoperative tetany was cured by transplantation.

With regard to injuries of the recurrent nerve Dubs states that every patient with goiter should be examined with the laryngoscope before operation and on discharge. In the cases reviewed the recurrent laryngeal nerve was not exposed in the dissection. Permanent lesions of this nerve resulted in 1.9 per cent. Squeezing injury of the nerve resulted in permanent paralysis in four cases in spite of the fact that the nerve was not cut and was grasped only momentarily.

The material of 1914 to 1919 was studied with regard to the recurrence of goiter. Only cases in which the patient was re-examined (255) were included in the investigation. Every "regrowth of the goiter" which was visible and palpable was counted as a recurrence. Only 44.7 per cent of the patients were found free from recurrence.

Hemistrumectomy has been rejected in the author's vicinity because a recurrence develops in 67 per cent of the cases so treated. Even when the goiter is distinctly unilateral the unilateral operation is insufficient. Dubs believes that while the ligation of the four arteries does not prevent recurrence with absolute certainty, it limits it to a great extent. He is unable to draw definite conclusions on this point from the cases he reviews, however, as only four of the patients who were subjected to ligation of all four arteries returned for examination.

Operations for recurrences were done in 6 per cent of the cases. More than half of the patients who were operated on once for recurrence developed another recurrence. Because of his conviction that there are goiters which cannot be entirely cured by surgery, Dubs recommends prophylactic treatment with iodine following operation.

HELLWIG (Z).

Klose, H., and Hellwig, A.: Recurrence of Goiter (Ueber Kropfrezidive). *Klin. Wchnschr.*, 1922, i, 1885.

The authors review from the standpoint of recurrence 211 cases of goiter operated upon by the classical methods and followed for five to eighteen years. A recurrence developed in 40 per cent and an operation for recurrence was performed in 23.3 per cent. Most of the recurrences developed between the twenty-first and twenty-fifth years of age.

Recurrence is dependent less upon the type of operation than upon the character of the goiter. The small nodular tumors and the diffuse colloid strumæ show a particularly strong tendency to recur. According to the authors, the cause is too extensive resection in these forms of goiter. Therefore in the selection of the operative procedure the function of the thyroid must be taken into consideration. Resection should be as radical as possible in cases of hypersecretion and less extensive in cases of hyposecretion.

KOENIG (Z).

Okada, W.: The Treatment and Prognosis of Carcinoma of the Larynx. *Ann. Otol., Rhinol. & Laryngol.*, 1922, xxxi, 601.

An experience with over 400 cases extending over a period of twenty years, and a study of 141 cases operated upon constitute the basis of this very interesting article.

In practically every early case of laryngeal cancer in which the disease was limited to a nodal lesion of the vocal cord and there was no involvement of the ventricular membrane or fixation of the cord, the author obtained a permanent cure by endolaryngeal operation, with or without the use of suspension laryngoscopy. These cases, however, numbered only thirteen. Absence of involvement of the ventricle is demonstrated by the use of the author's ventricular laryngoscope. After the tumor has been removed surgically the spot should be thoroughly cauterized with the galvanocautery or treated by an application of radium.

In twelve cases with involvement of the ventricular membrane or muscles, thyrotomy with a preliminary tracheotomy was performed according to the suggestion of Chian and Semon but with only fair results.

Hemilaryngectomy and partial extirpation of the larynx, although indicated by the appearance and location of the tumor, proved impractical. Most laryngeal carcinomata are too extensive for such simple procedures. Nothing less than a total extirpation of the larynx under strict asepsis has proved of any avail. The author removes the larynx from below upward, amputating below the ring cartilage by a cut slanting upward from front to back. He then sews the lower tracheal end into the skin and completes the removal of the larynx, repairing torn tissues immediately. He removes also all regional lymph glands and ducts.

Of 106 cases operated upon in the manner described, many of which were not good surgical risks, thirty-six showed no recurrence after three years and fifty-five were cured. Of ten recurrences, three were cured by reoperation; the rest were glandular recurrences, some of which could have been relatively cured by reoperation. In six cases death resulted from other causes within four weeks after the operation.

Chloroform is the anæsthetic of choice, but six cases were operated upon successfully under local anæsthesia.

MAURICE H. COTTLE, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Hald, J. K.: Bleeding Breasts; with a Few Cancer Statistics from the Drammen Hospital (Ueber blutende Mammae mit einer kleinen Krebsstatistik aus dem Krankenhaus Drammen). *Norsk Mag. f. Lægevidensk.*, 1922, lxxxiii, 592.

Two cases of bleeding breasts are reported. The first was that of a widow, 45 years old, the mother of four children, whose left nipple had secreted a somewhat bloody to bloody-serous fluid during the last half year. No tumor was demonstrable on palpation. The amputated breast showed a dilated milk duct and a bean-shaped, pedunculated, papillomatous tumor beneath the nipple. Several smaller and similar intracanalicular tumors were seen in the vicinity. The microscopic examination showed a structure somewhat similar to that of adenocarcinoma, but without any infiltrating growth.

The second case was that of a woman 38 years old who had given birth to two children. The left nipple had dripped blood for six weeks and a tumor the size of a nut had grown to the size of a mandarin. Microscopic examination revealed carcinoma.

From 1894 to 1921, 111 cases of cancer and thirty-three cases of benign tumors of the breast were treated in the Drammen hospital. Among the cases of carcinoma there was only one with bleeding from the breast. In eight cases it was probable that a benign tumor had undergone malignant degeneration. From 1894 to 1911 there were thirty cases of ulcerating carcinoma in which the average period of observation of the tumor was fourteen months, while from 1912 to 1922 there were

thirteen cases with a period of observation of nine months.

A bleeding breast is a rare condition. The bleeding may be vicarious menstruation or due to inflammation of the breast or a neoplasm. Benign tumors causing hæmorrhage are cystadenomata and intracanalicular papillomata. Hæmorrhage is frequently the only sign of the latter. Bleeding occurs in only 1 to 9 per cent of the cases of malignant breast tumors, but as malignant tumors are far more common than benign tumors, hæmorrhage should suggest the presence of carcinoma.

If the cause of the bleeding is a neoplasm, the treatment should always be operative as a benign tumor may undergo malignant degeneration.

KORITZINSKY (Z).

Lee, B. J.: The Treatment of Recurrent Inoperable Carcinoma of the Breast by Radium and the Roentgen Ray. *J. Am. M. Ass.*, 1922, lxxix, 1574.

This article reports the results of a study of recurrent mammary cancer treated in a breast clinic during the years 1918, 1919, and 1920. Practically all of the 218 patients have been traced to the present date. The object of the study was to determine whether or not radiation treatment of recurrent carcinoma of the breast is justified by the results.

Only six of the 218 cases could be considered fairly as operable. Ninety-four were so far advanced at the time of admission that they were obviously hopeless from the outset. Of the 124 patients in whom favorable results from irradiation might be expected, thirty-one (25 per cent) were alive at the time this report was written, and of these, the condition of twenty-two is good while that of nine is poor.

In the cases treated by irradiation following the appearance of recurrence, the average length of life after recurrence has been two years and four months. This compares very favorably with a series of cases observed at the New York Hospital.. The length of life after recurrence following a radical amputation without subsequent irradiation was six and one-half months. While the author is cognizant of the varying course of different types of breast cancer, he believes that the results cited indicate that irradiation is of definite value.

In general, the more cellular the tumor, the better its response to treatment by irradiation, and the younger the woman and the more rapid the recurrence, the poorer the result of irradiation.

Small localized lesions in the intraclavicular region or adherent to or involving the chest wall, small localized skin metastases, and small accessible nodes are most amenable to treatment by radium. The recurrences which are best treated by the roentgen ray include diffuse cutaneous involvement, the so-called inflammatory carcinoma, extensive involvement of nodes in the axillary or supraclavicular regions, mediastinal and pleural metastases, and bony metastases.

A study of the cases in this series leads the author to the following conclusions:

1. A careful selection of patients for operation must be made as a precaution against the recurrence of breast carcinoma.

2. Pre-operative and postoperative cycles of roentgen-ray treatment are important prophylactic measures against recurrence.

3. A follow-up of every case of carcinoma of the breast operated on should be adopted as a routine.

4. Irradiation properly applied to recurrent breast carcinoma definitely prolongs life.

5. With more complete knowledge and better technique, further control of the recurrent phase of this disease may be expected.

ADOLPH HARTUNG, M.D.

Sittenfield, M. J.: Does Radiation Enhance Postoperative Recurrence of Carcinoma of the Breast? *J. Radiol.*, 1922, iii, 476.

Surgical statistics indicate that surgery alone is far from satisfactory in the treatment of carcinoma of the breast. Over 70 per cent of the patients thus treated do not survive the five-year period and most of those who do had early localized tumors without glandular involvement at the time of operation. Of those with axillary or other lymph-node involvement less than 30 per cent survive the five-year period. It is the latter type of case particularly which should be given the benefit of whatever additional treatment may improve the ultimate results.

Marked discrepancy in the results reported by various authorities relative to radiotherapy plus surgery in the treatment of breast cancer induced the author to make a critical study of seventy-three cases thus treated under his care. His clinical observation since the introduction of the modern technique of intensive radiation within the past twenty months has impressed it upon him that pre-operative or postoperative radiation with proper technique will greatly improve the end-results. Of the seventy-three cases, fifteen were given pre-operative radiotherapy and twenty-three postoperative radiotherapy. Of these, thirty-six were arrested clinically and the other two were favorably influenced. Twelve cases of recurrence following operation showed clinical arrest of the condition in nine, and no favorable influence in one; two of the patients died. In fifteen cases there were distant metastases following the operation; three of these patients showed clinical arrest of the condition, three were not benefited, and nine died. Of eight patients who were inoperable when first seen, four showed a clinical arrest of the condition, two were rendered operable, and two died.

From this brief clinical report it is obvious that, though it has not given a clinical cure in every case, pre-operative and postoperative radiation has exerted a most beneficial influence. The argument advanced by the adversaries of postoperative radi-

ation, namely, that it may bring to greater activity any cancer cells left behind at the time of operation, is not tenable if a proper radiation dosage is used. It is of paramount importance to give a dose which will completely destroy cancer foci in the areas inaccessible to the knife. In the author's opinion the best interests of persons with carcinoma of the breast have not been served unless they have received the combined aid of the surgeon and radiotherapist.

ADOLPH HARTUNG, M.D.

TRACHEA AND LUNGS

Serra, C.: Tracheocele Complicated by an Effusion of Blood (Tracheocele complicato da versamento ematico). *Ann. ital. di chir.*, 1922, i, 665.

The patient was a woman aged 40 years who for five years had had a tumor the size of a small nut in the right side of the neck. On clinical examination the growth was found in the supraclavicular fossa beneath the two ends of the sternocleidomastoid muscle and covered by normal skin. It was not disturbed by ordinary breathing, speech, or swallowing, but pressure on the trachea increased its size and it could then be easily reduced by manual compression.

At operation a tracheal cyst containing dark bloody fluid was removed after ligation of its pedicle.

Aeroceles of the trachea are congenital or acquired. Those of the first type are due to an anomaly of development and remain latent until affected by some special agent such as increased air pressure. Those of the second type are the result of a pathologic process or trauma which has weakened the tracheal wall.

Serra reviews the literature of congenital and acquired aeroceles which arise internally or externally in relation to the laryngotracheal lumen. In his own case histologic examination showed clearly that the cyst was derived from the posterior wall of the trachea. The effusion of blood into the sac had occluded the air canal and transformed an aerocele into a hæmatocele. As far as Serra is aware, no similar case has been described in the literature. There are few cases in which such cysts contain fluid in addition to air.

False aeroceles are paralaryngeal or paratracheal.

W. A. BRENNAN.

Hedblom, C. A.: Graded Thoracoplasty in Chronic Pulmonary Suppuration, with Special Reference to Diffuse Bronchiectasis. *Northwest Med.*, 1922, xxi, 423.

Hedblom reviews the results of the surgical treatment of bronchiectasis and chronic pulmonary abscess, pointing out that drainage, collapse therapy, and lobectomy have all yielded a relatively low percentage of cures and are associated with a high mortality. Attention is drawn to the fact that chronic abscess is sure to become multilocular and to lead to bronchiectasis; in many instances it is impossible to determine which condition is the chief source of symptoms. For such cases Hedblom proposes the term "chronic preliminary suppuration."

Six cases of unilateral bronchiectasis are reported in which an extensive collapse of the chest wall was accomplished in stages without any mortality and with marked benefit. In two, the duration of symptoms was two years and in four it was four years, eight years, nine years, and over twenty years respectively. The average amount of sputum in each of these cases was from 240 to 1,000 c.cm. per twenty-four hours. The operation was performed under combined regional and nitrous oxide anæsthesia. Segments of ribs were resected first posteriorly, than anteriorly, and then at the sides. As in every case the condition involved chiefly the lower lobes, it was deemed unnecessary to resect the second or first ribs. After the posterior resection the nerve trunks were injected with alcohol to prevent the voluntary inhibition of cough because of postoperative pain.

In the first case the first operation was not sufficiently radical. Subsequently a secondary operation was performed with promising results. In the second case the quantity of sputum, which before operation was 1,000 c.cm. or more per twenty-four-hour period, averaged from 30 to 60 c.cm. during the two years that have elapsed since the operation. The third case has remained free from symptoms since operation, a period of about a year.

A similar graded thoracoplasty was performed in six cases of chronic multiple pulmonary abscess. Three of the patients died. Autopsy showed multiple abscesses involving the whole lung in two and also the opposite lung in one.

The author concludes that graded thoracoplasty merits further consideration in the treatment of chronic non-tuberculous pulmonary suppuration, and particularly in bronchiectasis.

Sutton, G. E.: Pulmonary Fat Embolism. *Ann. Surg.*, 1922, lxxvi, 581.

The author discusses in detail the various factors entering into the causation of pulmonary fat embolism. The most important of these are injury to the fatty tissue and a break in the continuity of the circulation allowing fat droplets to enter the blood stream. Mobility of the injured area is important in favoring the entrance of fat into the circulation.

Such cases show the lung capillaries filled with fat droplets. In later stages fat emboli may be found through the peripheral circulation. The central nervous system also may be involved.

The symptoms occur suddenly, even during the operation. They may be either pulmonary or cerebral in character, and these types may appear either alone or in combination. Death occurs relatively soon, usually within the first three days. Active treatment has not met with much success.

The danger of pulmonary fat embolism is particularly great in major operations on obese persons, especially if it is necessary to destroy fatty tissue.

Complete hæmostasis and careful drainage of the wound are essential. Pulmonary fat embolism should be taken into consideration as a complication in any surgical case in which there is destruction of fatty tissue and there are symptoms of cyanosis, rapid or laboted respiration with or without cough, elevated temperature, and an increased pulse rate with low tension. The sputum, urine, and eye grounds should be investigated for fat as an aid in the diagnosis in all suspected cases.

Tyler, A. F., and Blackman, J. R.: The Effect of Heavy Radiation on the Pleuræ and Lungs. *J Radiol.*, 1922, iii, 469.

The study of the effect of radiation on the pleuræ and lungs is becoming more and more important with the increasing use of radiation in the treatment of cancers of the breast. It is even more important in cases referred for treatment following the surgical removal of cancer of the breast because any untoward action on the pleuræ and lungs cannot be excused on the ground that the severity of the lesion demanded the treatment regardless of the nature of the after-effects. All of the cases discussed are those sent for prophylactic postoperative irradiation. Those with demonstrable malignancy of the lungs or pleuræ have been omitted.

The changes observed roentgenographically were essentially those of a progressive fibrosis of the lungs. They began at the hilum and extended toward the periphery along the bronchi in the shape of a fan. Subsequently there were signs of pleuritic thickening, and in the terminal stages the changes assumed the characteristics of a pneumonic consolidation. In some cases a moderate amount of pleural effusion developed. The formation of pleuro-pericardial adhesions and adhesions between the visceral, parietal, and diaphragmatic pleuræ resulted in demonstrable changes of position and motility.

In the cases observed the amount of radiation given before changes were noted varied within wide limits. The earliest change noted occurred in a patient who had been given 120 ma.-min. over the back of the chest in two equal doses. The case having the largest dose before changes were recognized had 540 ma.-min. over the front of the chest and 190 over the back. The average for the seven cases was 257 ma.-min. over the front and 190 over the back of the chest.

Clinically it was found that the physical findings and symptoms were such as might be expected from the changes demonstrable roentgenographically. Harsh breath sounds were an early and constant characteristic in all cases in which there was a fibrotic change in the lung and increased in intensity as the process progressed. Pleuritic pain accompanied by a friction rub was noted early. As the process continued, the symptoms became more marked, and in advanced cases dyspnœa, cyanosis, and cardiac embarrassment developed.

Seven cases are cited in detail as regards their clinical history, physical examination, and roentgen findings, and serial roentgenograms of each case are included to show the progressive changes.

From a study of these cases the authors draw the following conclusions:

1. As a rule, prophylactic irradiation of the chest following the surgical removal of the breast should be carried out with what might be called a "superficial technique," that is, low voltage and thin filters should be used instead of high voltage. It is unwise to repeat the dosage more than two or three times.

2. It appears that the high voltage technique should be reserved for inoperable cases of carcinoma of the breast.

3. This pathology should be definitely recognized by the medical profession so that the patient will not be given more radiation after the changes are manifest. Knowledge of this pathology will also influence the prognosis. ADOLPH HARTUNG, M.D.

Collins, C. U.: Surgery of the Lung. *Illinois M. J.*, 1922, xlii, 372.

Collins reports the case of an 11-year-old girl who swallowed a tack and two months later, because of a cough and expectoration, was sent to a tuberculosis sanitarium where her condition improved. Two years later she was taken with influenza, and for several weeks had a temperature ranging from 100 to 105 degrees F. At this time an X-ray examination of the chest showed a large tack in the left bronchus just posterior to the central portion of the heart. Two attempts to remove the tack with the bronchoscope were unsuccessful. A year later the tack was removed by operation performed without differential pressure anæsthesia. A trap-door incision including the fifth, sixth, and seventh ribs was made. This large opening caused no particular phenomena. The tack was felt near the hilus and its position verified by fluoroscopic examination. The bronchus containing it was cut, the tack removed, and the bronchus sutured. The chest was then closed around a drain. About two weeks later the bronchial incision must have opened again as bubbles of air issued with the pus from the chest wound. The patient progressed well and was discharged from the hospital in good condition. Several months later an abscess evidently originating from the cut surface of one of the ribs developed at the site of operation. Evacuation of this abscess was followed by prompt recovery. RALPH B. BETTMAN, M.D.

PHARYNX AND ŒSOPHAGUS

Brown, T. A.: Two Cases of Symptomless Perforation of the Œsophagus Revealed by Sequelæ in the Lungs. *Lancet*, 1922, cciii, 1272.

In the cases reported the œsophageal perforations were found at autopsy. The author believes they were caused by a foreign body although the histories were negative in this respect and no foreign body was recovered.

The first case was that of an 8-year-old girl who, following a trivial cough for a few days, coughed

up a half pint of blood. The patient did not appear ill. In the lower right axilla and back there was percussion dullness associated with diminished vocal fremitus, harsh breath sounds, and prolonged expiration. There was no pain or dyspnœa. The temperature was 102 degrees F., the pulse 120, and respiration 24. Hæmoptysis occurred on three consecutive days. On the third day the breath became fœtid and the physical signs at the right base were more pronounced. The daily temperature ranged from 100 to 103 degrees F. The micro-organisms in the offensive sputum were chiefly streptococci and micrococcus catarrhalis. A patch of skodiac resonance developed in the right base. The X-ray revealed no foreign body but showed an irregular opacity in the lower two-thirds of the right lung suggesting a cavity. The right chest scarcely moved with respiration. The patient gradually grew weaker and died twenty-seven days from the time of her admission to the hospital.

At autopsy the congested left lung showed a collapsed patch near the apex. The right pleural cavity was full of dark-brown foul-smelling fluid containing fragments of disintegrated lung. Only the lower part of the right lung remained and this was gangrenous except for a few areas which were solid and gelatinous. There were no adhesions or enlarged lymph glands. A small sinus from the right side of the lower end of the œsophagus led into the gangrenous mass in the right pleural cavity. No foreign body was found. The liver and myocardium showed cloudy swelling.

Case 2 was that of a man aged 49 years who complained of dyspnœa and pain in the right chest. During the past twenty years he had had bronchitis and emphysema, and on several occasions had been treated in a hospital. Five years previously he had had "fits" accompanied usually by hæmoptysis and on one occasion by vomiting. There was always considerable sputum, which sometimes was blood-stained but did not contain tubercle bacilli.

At the time of examination the patient's temperature was 100 degrees F., his pulse 100, and his respiration 33. Clubbing of the thumbs and advanced pyorrhœa were noted. The urine contained a considerable quantity of albumin. Râles were heard over the entire chest, and expiration was prolonged.

The patient expectorated daily about 6 oz. of sputum which showed pus cells, streptococci, and micrococcus catarrhalis. Six days after his admission to the hospital he had an attack of hæmoptysis and died.

Autopsy revealed in the œsophagus, opposite the bifurcation of the trachea, a small puckered area, across which narrow fibrous bands were stretched. Behind the bands a small opening led downward into the right bronchus just beyond the tracheal bifurcation. There was no sign of surrounding inflammation. The trachea and bronchi contained a large quantity of coagulated blood. At the base of the right lung were dense pleural adhesions. The left lung was voluminous and the lower lobe showed œdema and congestion. The upper right lobe contained an abscess surrounded by consolidated and partly necrotic lung. Near this area were two gritty particles which analysis showed to be cadmium (possibly a tooth filling). Elsewhere the lung tissue was congested but not consolidated. There was no tuberculosis. Both kidneys showed subacute glomerulotubular nephritis.

WALTER C. BURKET, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Coyte, R.: The Anatomy and Surgical Bearing of the Nerves Found in the Abdominal Wall. *Lancet*, 1922, ccii, 1065.

The anatomical distribution of the abdominal nerves leaves certain areas where abdominal incisions can be made with little danger of nerve injury. In entering the abdominal wall the nerves leave a space of 4 in. above the first trunk in which there is no large nerve, an ideal space for the incision for a gall-bladder operation. The incision may be made obliquely from the inner costosternal angle for a distance of 4 in. without danger of injuring any large nerve. If necessary, it may be continued outward 2 in. further, in which case only one nerve trunk, the seventh intercostal, will be cut.

After piercing the rectus sheath on its outer border, the nerve passes into the rectus muscle near its center. Therefore the incision may be made vertically through the inner half of this muscle without injury to the nerves. Such an incision may be used for appendectomy. Because of the almost horizontal position of the lower nerves, the appendix can be approached also through an incision beginning near the antero-superior spine and curving inward and downward in the form of a crescent.

Excellent exposure for splenectomy can be obtained without nerve injury by making on the left side an incision similar to that for gall-bladder operations and a vertical incision from its inner end down the midline of the abdomen.

MARCUS H. HOBART, M.D.

Wreden, R. R.: Radical Operation for Femoral Hernia with the Aid of Active Muscular Closure (Radikaloperation des Schenkelbruches mittels eines aktiven Muskelverschlusses). *Wiener Chir. i pogran. oblasti*, 1922, i, 81.

In radical operation for femoral hernia Wreden's aim is to restore active muscular closure of the femoral ring. The region of the crural canal is exposed by a V-shaped incision with its apex over the pubic symphysis. After freeing and amputation of

the hernial sac, a strip with a lateral base is dissected from Poupart's ligament, drawn under the pectineal muscle, and sutured to the symphysis. A row of sutures joining the lower border of Poupart's ligament to the pectineal muscle is then inserted. When the muscles of the abdomen or of the thigh are then brought into play, the femoral ring is closed by the restored pectineus-abdominal muscle connection.

The author has operated successfully by this method ten times. PETROW (Z).

Hellendall, H.: The Radical Operation for Inguinal and Femoral Hernia with Plastic Use of the Uterus through the Abdominal Cavity and a Simultaneous Laparotomy for Another Condition (Die Radikaloperation von Leisten- und Schenkelhernien mittels plastischer Verwendung des Uterus von der Bauchhoehle aus, bei gleichzeitiger Laparotomie aus anderem Grunde). *Zentralbl. f. Gynaek.*, 1922, xlvi, 1028.

In accordance with the suggestion of Freund, the author utilizes the uterus in the operation for plastic closure of the femoral ring through the abdominal cavity. The uterus is mobilized by means of the vesico-uterine fold, pushed to the side, and sutured as a pad in front of the internal femoral ring. As a preliminary procedure the internal femoral ring is sutured, the hernial sac being left intact.

Similar methods for the treatment of femoral hernia through the abdomen were originated by Oehlecker, Madlener, and Mayer and are described for comparison. KALB (Z).

Souttar, H. S.: The Operative Treatment of Difficult Herniæ. *Brit. M. J.*, 1922, ii, 1024.

To close the orifice of a hernia Souttar uses thick floss silk which has been boiled for an hour in 1:1,000 mercury perchloride, dried in a 1:1,000 solution of biniodide in absolute alcohol, and then kept in sterile liquid paraffin. Lange used material prepared somewhat similarly for the construction of artificial tendons and ligaments. Silk thus treated is soft and flexible but retains its full tensile strength. When introduced into the tissues it does not cause irritation, and it has the curious property that although it is not absorbed, it is so entirely assimilated that the resulting structure closely resembles normal tendon or aponeurosis, but possesses the great advantage that it will not stretch.

The closure of hernial orifices by this method is exceedingly simple. When a peritoneal sac is present the margins are drawn together with care to retain a portion of the sac. The method is quite satisfactory also for cases of hernia in which there is no true peritoneal sac as the surrounding tissues provide an adequate attachment, the opening in the muscular abdominal wall being darned by interlacing strands of the silk from side to side of the aperture. The strands are arranged so as to form a net with meshes about ¼ in. square. No attempt is made to close the aperture by pulling the sides of the opening together, the tension being only such as will bring the margins to their normal anatomical position. H. A. MCKNIGHT, M.D.

Denzer, B. S.: The Diagnosis of Peritonitis and Peritoneal Transudates by Means of Abdominal Puncture with a Capillary Tube. *Arch. Pediat.*, 1922, xxxix, 720.

Because of the difficulties in the diagnosis of peritonitis in infants, efforts were made by the author to devise an instrument which would demonstrate the presence of minute amounts of fluid in the peritoneal cavity. Through the shaft of a metal trocar cannula ½ in. long and with a 17-gauge bore he inserted glass tubing and then cut the tubing off so that it protruded 1 or 2 mm. from the tip. When this trocar cannula is inserted through the abdominal wall a sudden release of pressure indicates when it has entered the peritoneal cavity. The trocar is then removed and the capillary tube inserted as far as it will go. Denzer says it is advisable to wait a few minutes and to turn the needle in various directions before concluding that there is no fluid.

In over a hundred taps done in this manner there were no complications. E. C. ROBITSHEK, M.D.

Reichle: The Surgical Treatment of Peritonitis (Zur chirurgischen Behandlung der Peritonitis). *Zentralbl. f. Chir.*, 1922, xlix, 997.

If the primary focus can be wholly removed the abdomen is entirely closed, even in the presence of exudate. It is washed out only if it contains a large quantity of gastro-intestinal contents. Mikulicz's tamponade is employed unless the surfaces can be entirely covered with peritoneum. Particular attention is paid to the cul-de-sac of Douglas. The abdomen is closed tightly around the gauze drain. In the total number of cases of appendicitis treated by the author—including cases of peritonitis—the mortality was 5 per cent, while in 130 cases of severe peritonitis with perforation (among which were ninety-seven late cases) it was 58.5 per cent.

Goebel, Borchard, Hufschmid, and Melchior employ tamponade as little as possible and through narrow openings in the abdominal wall. Pende considers a 0.9 per cent sodium-chloride solution too irritating as a wash for the suppurated abdomen and recommends normal salt solution. Goebel, Hoffmann, and Rudolf advise enterostomy when necessary. Guetig emphasizes the fact that ether escapes too rapidly and may favor postoperative adhesions. In cases of abscess of the cul-de-sac of Douglas, Rudolf introduces Pregl's solution through an abdominal drainage tube. He finds that this prevents the secretion of pus and favors rapid healing. The stomach is washed out. Brossmann reported the cases of two persons with acute peritonitis who came to the operating table in such a grave condition that he was able only to open the abdomen, drain the pus, and pour in 200 c.cm. of narcotic ether. A cure resulted in both instances.

SCHULTZE (Z).

GASTRO-INTESTINAL TRACT

Moppert, G. G.: Gangrenous Perforation of the Stomach, a Complication of Diaphragmatic Hernia (La perforation de l'estomac par gangrène, complication de la hernie diaphragmatique) *J. de chir.*, 1922, xx, 453.

Usually a perforated gangrenous stomach is found as soon as the abdomen is opened. Free of adhesions, it floats in a peritoneal cavity filled with gastric contents. If the surgeon does not make a thorough exploration he attributes the localized gangrene to a perforated ulcer, a phlegmon, a volvulus, or arteriomesenteric compression, when the true cause may be a diaphragmatic hernia. In the latter event the evolution is as follows:

The stomach becomes strangulated in a hernial sac or through a hiatus of the diaphragm. Its wall becomes gangrenous and perforated. The perforation having allowed the escape of gas, the strangulation and incarceration cease, and the stomach falls back into the abdominal cavity, discharging its contents through the perforation.

Moppert describes three clinical cases of gangrenous stomach due to diaphragmatic hernia. The first was that of a man aged 42 years who had a congenital hiatus of the diaphragm in which the stomach, omentum, and spleen had probably been involved since intra-uterine life. The patient was operated upon the day after he entered the hospital with symptoms of peritonitis but died.

The second case was a case of congenital diaphragmatic hernia in a girl of 17 years. The stomach was strangulated in the sac and had perforated and become freed. This patient also died following an operation.

The third case was that of a woman aged 28 years who had a congenital hernia and incarceration of the stomach with the symptoms of acute obstruction and perforation followed by incarceration and peritonitis due to the discharge of gastric contents into the peritoneal cavity. Death occurred six hours after operation.

In general, gastric perforation occurring in a strangulated diaphragmatic hernia has been attributed to volvulus. In 500 diaphragmatic hernia Payr found twelve accompanied by volvulus of the stomach and in most cases this was complicated by perforation. In thirty-six cases Iselin found no perforation of the stomach but demonstrated perforations of the transverse colon. In the three cases reported by Moppert there was no volvulus.

W. A. Brennan

Halbertsma, J. J.: A Fibroma of the Wall of the Stomach Adherent to an Ulcer on the Lesser Curvature (Ein Fibrom der Magenwand verwachsen mit einem Geschwür an der kleinen Kurvatur) *Nederl. Tijdschr. v. Geneesk.*, 1922, lxv, 902.

Cancer and ulcer are among the most common lesions of the stomach, while gastric sarcoma and gastric lipoma are very rare. On the other hand, fifty-five cases of fibromyoma of the gastro-intestinal tract were reported during the year 1921.

The author describes the rare combination of gastric ulcer with fibroma of the stomach. The anaemia caused by the fibroma led to the assumption that the tumor was partly responsible for the development of the ulcer. In the author's opinion the fact that the fibroma was situated on the lesser curvature, namely, on the gastric strait of Waldeyer, justifies the assumption that it was the primary condition and the ulcer was secondary.

Korn (Z.)

Delore, X., and Dunet, C.: Repeated Interventions in Gastric Carcinoma (Des interventions itératives dans le cancer gastrique) *Rev. de chir.*, Par., 1922, xli, 350.

The authors advocate secondary surgical interventions in cases of gastric carcinoma in which symptoms of stenosis of the artificial opening become manifest.

The gastro-enterostomy opening may become closed by involvement of its gastric side by the growth or mechanically by metastases in the transverse mesocolon or other structures immediately adjacent. Though the secondary operation is only palliative, the authors believe the formation of a new opening is indicated to give as much relief as possible.

Loyal E. Davis, M.D.

Cignozzi, O.: The Importance of Ascaridiasis in Surgical Practice (L'importanza dell'ascariasi nella pratica chirurgica) *Rassegna internaz. d. clin. e terap.*, 1922, iii, 446.

When worms take up a definite location in the body their toxic products have very important effects upon the blood, the nervous system, the temperature, and the nutrition. Several investigators have found that in animals such toxic products may cause death.

Cignozzi discusses in particular the secondary phenomena due to the disturbance of worms from their fixed locations and their migration caused by operations on the abdomen. Migration is almost always upward. Both ether and chloroform cause the detachment of worms from the intestinal mucosa and leave them free in the intestinal lumen. Common enteropathies may be complicated by symptoms due to worms, and the postoperative course in such cases is often similarly complicated. Cignozzi has frequently observed such deviations from the normal in patients known to be carriers of worms. This phase often culminates in the vomiting of worms or their discharge in the fæces. Twelve to twenty-four hours after operation there is peri-umbilical pain and after forty-eight hours vomiting occurs. Such disturbances are in no way due to the primary lesion or the operative technique. The blood shows a decided eosinophilia sometimes higher than 20 per cent, the pulse is small and frequent, and there may be meteorism and diarrhœa. The disturbance may persist for several days, and it is only by examination

of the vomitus that the surgeon can determine the cause of the condition. During the attack the intestine may or may not show an acute catarrh.

In some cases migrating ascarides cause perforation of the intestinal wall.

The conclusion drawn by the author is that patients with a history of worms should be given treatment for this condition before they are operated upon. W. A. BRENNAN.

Lane, W. A.: On the Treatment of Non-Malignant Affections of the Colon. *Lancet*, 1922, ccIII, 1114

Lane regards all abnormal conditions of the colon as the direct or indirect result of chronic intestinal stasis. He classifies them into two main groups, viz., cases of intestinal stagnation in which a reaction takes place and those in which a reaction is altogether absent.

One group is characterized by the formation of bands to the colon. One band of importance forms at the right iliac crest, another below the gall-bladder, one at the splenic flexure, one at the left iliac crest, and one in the left iliac fossa. The first and last are the most important. Mention is made also of the so-called "Lane kink" or band kinking the terminal ileum.

According to the author, these bands are all evolutionary, identical in origin, function, and structure, and due to the effort of the organism to meet an abnormal loading up of the bowel resulting from distal obstruction.

Another important development which arises not infrequently in consequence of the strain exerted by the loaded cæcum is what Lane calls "the controlling appendix," an appendix which acts as a ligament, having become attached by adhesions to the under surface of the mesentery behind the end of the ileum. When the ileum and cæcum drop into the pelvis the ileum is kinked abruptly over the anchored appendix and its lumen is more or less occluded. The kinking of the anchored appendix favors obstruction of the appendiceal lumen. The removal of such an appendix is followed by great benefit.

It is in this type of static colon that cancer of some portion of the gastro-intestinal tract commonly occurs.

The other extreme type of chronic intestinal stasis is characterized by complete absence of effort on the part of the organism to oppose the elongation and prolapse of the large bowel, no new acquired bands or membranes being formed. The pelvic colon becomes greatly elongated, forms many abrupt angles in the pelvis, and offers great resistance to the passage of solid material through it. In consequence, an infection of the mucous membrane of the proximal colon takes place, producing colitis and its complications.

In cases of obstruction associated with the formation of bands the operation for "the first and last kink," as Lane calls the kink in the left iliac fossa, consists in careful separation of the bands which form the kink and the accurate apposition of the peritoneal edges if any are left deprived of serous covering. Other bands and a "controlling appendix" are then dealt with if present. If an ileal kink is found and the membrane is extensive, a drainage tube is put in because the acquired membrane contains infecting organisms.

In fat subjects another complication of obstruction with the formation of bands is diverticulitis. This may be met by inserting the divided end of the ileum into the pelvic colon. As in cases of colectomy, the patient should be instructed to secure three evacuations daily. In some cases colectomy offers the best results.

Tuberculous ulceration of the colon following obstruction is frequently limited to the proximal half. For this sequela, either of the operations mentioned may be advisable.

In cases of disease of the colon without the formation of bands, auto-intoxication is the condition requiring attention. This is the result of infection of the contents of the small intestines. Such infection causes most serious degenerative processes in every tissue of the body and renders the subject liable to infection by other diseases. Shortening of the colon, colectomy, or the uniting of the divided ileum to the pelvic colon is indicated when medical methods have failed.

A complication of the elongated large bowel is a chronic or acute volvulus. This should be corrected by operation. Lane has excised the volvulus and performed a colectomy for this complication. The same procedures may be applied to megacolon. Much the same treatment is advocated for severe cases of mucous and membranous colitis, but resorted to less frequently.

Cancer is the final condition following chronic intestinal stasis. CARL R. STEINKE, M.D

Lockhart-Mummery, J. P.: The Treatment of Acute Obstruction from Cancer of the Colon. *Lancet*, 1922, ccIII, 1117.

A small incision is made over the cæcum and a knuckle of the cæcal wall drawn out and protected with gauze swabs. An opening is then made in the cæcal wall with a knife, and a rubber drainage tube about ½ in. in diameter is pushed into the cæcum for 2 in. and stitched to the cæcal wall with catgut, each stitch going through the wall of the tube and picking up the cæcal wall ½ in. away from the tube. When the sutures are tied, a cuff of cæcal wall has been turned in. A pursestring suture is then inserted well away from the tube and tied so as to turn in more of the cæcal wall. The ends of this suture are tied and brought through the deep fascia and peritoneum. One or two other sutures are then placed so as to fix the cæcum at the point at which the tube enters to the deep surface of the abdominal wall, and the abdomen is sewed up around the tube. A wide collapsible rubber tube is tied to the end of the rubber drainage tube projecting from the dressings and carried to a pail under the bed. The tube

remains quite water-tight and gas tight for as long as a week, and as the contents of the cæcum are liquid, they drain readily through it; no leakage takes place in the wound and the patient is kept dry and comfortable.

After the obstruction has been relieved and all signs of toxæmia have disappeared—generally in five or six days—the abdomen is opened in the midline or on the left side, and the cause of the obstruction ascertained and dealt with under the most favorable circumstances.

These openings close in a week or ten days and most of them do not leak after the tube has come away. If the cæcum is not distended, exploration is called for as the obstruction is in the small bowel.

CARL R. STEINKE, M.D.

Fansler, W. A.: A Scalping Operation for Abscesses About the Rectum. *J. Lancet*, 1922, n.s. xlii, 567.

A substantial percentage of perirectal abscesses have a connection with the bowel, complete fistulæ being formed when they are opened.

Whether a bowel opening is present or not, the best treatment is early and radical incision, the wound being kept wide open while the cavity is granulating from the bottom upward. If the wound is not kept open a deep cavity or sinus with a small external opening results which renders healing and medication difficult or impossible. A T- or cross-shaped incision is preferable to a simple straight incision.

To obtain a wide-open wound the author recommends scalping the abscess. A liberal cross-shaped incision is made as near the anus as possible and the extent of the abscess cavity explored with the finger and probe. Removal of the four segments of the skin formed by the cross-shaped incision leaves a somewhat circular opening. In general, the circle of skin removed should be slightly larger than the greatest diameter of the abscess.

This method gives a truncated cone-shaped cavity, with its base outward, which is easy to dress and to medicate to its depths. Frequently the use of nitric acid or 40 per cent silver nitrate solution will heal a small opening into the bowel. If division of the sphincter is necessary later the patient will be in no worse condition than following an ordinary incision of the abscess, and the tract will be definitely defined.

In the author's experience the removal of the skin flap has not prolonged convalescence. By the time the wound has granulated from the bottom, the skin has contracted and healed down to meet it.

WALTER C. BURKET, M.D.

Pennington, J. R.: Carcinoma of the Rectum and Pelvic Colon: Age- and Site-Incidence and Prophylaxis. *J. Am. M. Ass.*, 1922, lxxix, 1859.

In 7,174 cases of carcinoma of the rectum the condition occurred between the ages of 41 and 70 in 75 per cent, and between the ages of 10 and 18 in twenty-four cases. Carcinoma of the pelvic colon has been found in a boy of 9 years and in a girl of 12.

In 1,428 of a series of 1,670 cases the cancerous tumor was within reach of the examining finger. In the remainder it was higher up in the bowel or at the rectosigmoid junction. The anterior wall of the bowel is generally involved. More frequent rectal examinations are necessary to discover this condition early.

Internal palpation, with or without proctoscopy and sigmoidoscopy, is our chief reliance in the diagnosis because none of the serum or other tests so far introduced has proved reliable. Bleeding, pain, and diarrhœa are not early signs of carcinoma of the rectum, but the evidence of considerable damage already done. The laity must be educated to get rid of any ailment which favors the development of cancer.

PAUL W. SWEET, M.D.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Bodnar, L.: Cholecystitis Cystica (Cholecystitis cystica). *Arch. f. path. Anat.*, 1922, ccxxxvii, 369.

The author describes the autopsy findings in the case of a woman 69 years old who was operated on for strangulation ileus and died from hypostatic pneumonia.

The gall-bladder contained two facetted concretions. When opened, it was 7.5 cm. long, 2 cm. wide and about 7 to 14 cm. thick. At the cut surface the mucosa was thickened, the thickness varying in different areas. Within the wall of the gall-bladder, and particularly in the muscle layer, the section showed numerous, very minute, spherical, smooth-walled spaces and also larger ones up to 4 mm. in diameter some of which were located just under the serosa. These spaces were lined by high cylindrical cells with longitudinally oval nuclei and goblet cells.

In the examination of the serial sections it was observed that all of the cavities, including those which appeared closed on all sides, opened into the lumen of the gall-bladder between the folds of the mucous membrane. In the wall of the gall-bladder there were also changes characteristic of the chronic cholecystitis which had run its course.

Bodnar believes that most of the cystic cavities had their origin in the Luschka ducts and that only some of the small ones in the region of the large spaces may be regarded as mucous glands changed by disease. The dilation of the Luschka ducts must be explained as resulting from an abnormally deep growth of their epithelial lining in addition to passive distention; the latter is responsible alone only in the peripheral parts of the cavities.

In addition to inflammatory irritation, a peculiar capacity of the epithelium of the Luschka ducts to proliferate must also be assumed as an etiological factor. It is possible that the findings described are characteristic of a precancerous stage. BUNGE (Z)

Morison, R.: The Diagnosis and Treatment of Cholelithiasis. *Brit. M. J.*, 1922, ii, 1005.

Of the many theories advanced to explain the formation of gall-stones the most universally popular has been that which attributes it to infection of the gall-bladder. Some predisposing causes are more common than others. Among the former are repeated pregnancies, obesity, and a sedentary life. In the author's experience the most frequent cause is insufficiency of fluid intake.

The subjective symptom on which a diagnosis of gall-stones can be based reasonably is severe pain referred to the epigastrium. This is often very sudden in onset, in some cases lasts only a few moments and in others for hours, and catches the breath before inspiration is complete.

A tender area over the gall-bladder on deep palpation during forced inspiration, discovered during the attack of the characteristic pain and lasting for a time after it, is a reasonably reliable indication of gall-stones, the diagnosis based upon it proving correct in eight cases out of ten.

A gall-bladder tumor or jaundice preceded by a typical attack of pain is usually a positive clinical indication.

There is only one reasonable treatment, viz., operation. In the author's opinion, cholecystotomy is the best operation when the cystic duct is patulous.

If the gall-bladder shows serious infection it should be opened freely, the stones removed, and the gall-bladder walls and interior carefully inspected. Unless the gall-bladder is so obviously diseased that recovery seems impossible, it should not be removed. If infected, it should be drained. If bile discharges freely, the tube should not be kept in for more than a few days, and never for more than two weeks.

If the gall-bladder is so severely diseased that its recovery seems impossible it may be dealt with by cholecystectomy or the thermocautery.

The author believes that in calculous cholecystitis the removal of the stones may be all that is necessary, but for primary cholecystitis, the operation of election may be cholecystectomy.

H. A. McKnight, M.D.

Willems, C.: The Technique of Exposing the Biliary Passages (Technique de la découverte des voies biliaires). *Arch. franco-belges de chir.*, 1922, xxv, 884.

Willems refers to the danger of vertical incisions. Vertical incisions near the border of the rectus cut a certain number of the terminal branches of the lumbar nerves supplying the muscle walls, causing unilateral paralysis. Transverse incisions are much less dangerous and when they are exactly sutured and heal by primary intention do not impair the muscle function. Willems has used such incisions for a long time. The lumbar region being raised by a cushion, the incision is begun near the median line, extended outward and obliquely along the costal border one or two fingerbreadths below the ribs, at about the site of the lower border of the liver, and continued to a point in the flank which is determined by the condition anticipated. It cuts through the right rectus, the obliquus major, the obliquus minor, the transverse, and, in its terminal part, the anterior fibers of the great dorsal muscle. The muscular bed traversed is therefore thick and formed of several planes.

If the liver is free from adhesions its lower edge rises into the wound when the abdomen is opened. If adhesions prevent this, they are detached. The liver is then basculated on the edge of the thorax to expose its lower surface. This is accomplished with the help of a special assistant wearing thread gloves over rubber gloves. The basculation greatly facilitates the approach to the biliary tract, the performance of cholecystectomy, catheterization, the extraction of calculi, and hepatic drainage.

W. A. Brennan.

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Melchior, E.: A Peculiar Form of Tumor-Like Osteomyelitis (Eine Sonderform der "tumorartigen" Osteomyelitis). *Med. Klin.*, 1922, xviii, 893.

This is a brief report of a case of osteomyelitis of the left thigh following influenza in a man 39 years of age. The onset was gradual and the disease was localized within narrow limits. A cortical sequestrum which was formed remained *in situ* during the entire course of the condition. The clinical picture was dominated by massive, soft granulation tissue which involved chiefly the extensor muscles. The tumor-like character of this tissue was so pronounced that only after its radical extirpation and the discovery of the sequestrum was it possible to exclude sarcoma and to make a correct diagnosis.

Lemke (Z).

Baker, C. F.: Report of an Unusual Foreign Body in the Arm. *Am. J. Roentgenol.*, 1922, n.s. ix, 727.

The patient, a woman, fell on the ice. The accident caused entire loss of function at the elbow and a small wound on the posterior surface of the forearm, just below the joint. The diagnosis made was traumatic injury of the elbow with possibly a compound fracture or a dislocation. The presence of a fracture was suggested by the projection of a small piece of "bone" from the wound. The surgeon in charge stated that he was positive as to the presence of a bone lesion as he had pressed

one of the "fragments" back under the skin at the time he rendered first aid.

The roentgen examination revealed only a number of straight parallel lines about 3½ in. long in front and slightly to the outer side of the elbow joint. These were interpreted as being due to a piece of lead pencil, and inquiry revealed that a pencil had been carried in a bag at the time of the fall. The pencil was removed and an uneventful recovery ensued with complete restoration of function.

ARNOLD HARTUNG, M.D.

FRACTURES AND DISLOCATIONS

Blanchard: The Trans-Olecranon Route for the Reduction of Old Dislocations of the Elbow (Voie transolécranienne pour la réduction des luxations anciennes du coude). *Presse méd.*, Par., 1922, xxx, 768.

The author reports a case of old dislocation of the elbow joint in which a fragment of the internal condyle lay in the olecranon fossa. By dividing the olecranon process with a Gigli saw he obtained a perfect exposure of the joint. The divided fragments of the olecranon were united with a screw. Passive motion was begun upon the fifth day.

LOYAL E. DAVIS, M.D.

Axhausen, G.: Necrosis of the Proximal Fragment in Fracture of the Neck of the Femur and Its Importance with Regard to the Hip Joint (Die Nekrose des proximalen Bruchstucks beim Schenkelhalsbruch und ihre Bedeutung fuer das Hueftgelenk). *Arch. f. klin. Chir.*, 1922, CXX, 525.

Because of the poor blood supply of the ligamentum teres, the proximal fragment in fractures of the neck of the femur other than intertrochanteric fractures is completely deprived of nutrition and becomes necrotic. Non-union in such cases is due, however, to the fact that the distal fracture surface is displaced anteriorly and the medullary spaces of the two fragments are not in apposition. Good adaptation of the fracture surfaces is probably responsible for the success of Shoemaker's application of a plaster cast with the leg in extreme internal rotation.

The necrosis has no effect on the consolidation of the bone, but is of great importance with regard to the subsequent function of the leg because when activity is resumed cartilaginous necrosis of the femoral head leads to arthritis deformans. There is also destruction of the tissue of the bone which lessens the resistance of the femoral neck to pressure and weight-bearing.

Axhausen had the opportunity to examine the proximal fragment resected in the case of a 16-year-old child who sustained a fracture of the neck of the femur nine months previously. Coxa vara and shortening of 3.5 cm. resulted. While the macroscopic changes were slight, microscopic examination showed almost total necrosis of the bone, the marrow, the epiphyses, and the joint cartilage. Bony union of the fragments had resulted in spite of considerable displacement of the distal fragment.

Experience has shown that cartilage deprived of sufficient nutrition is little able to withstand the trauma of function, becoming eburnated at the site of weight-bearing so that eventually the necrotic subchrondal bone is exposed. In addition, regenerative processes occur in the region of the few surviving cartilage cells of the marginal zone which lead to the formation of a marginal ridge and ultimately to arthritis deformans which becomes progressively more severe.

In advanced cases no trace of the necrotic cartilage remains. Because of the destruction of the bone substance, especially in the early stages, there is thinning of the bone which is indicated in the roentgenogram by a transparent area. Such a bone is weakened and must give way, particularly at the site where the epiphyseal cartilage has been replaced by connective tissue. This explains the various changes in form, such as coxa vara, which occur in these cases. It is very probable that similar changes occur in traumatic separation of the epiphysis and that the later gradual displacement of the epiphyseal cartilage is due to a more or less marked disturbance of nutrition. SIMON (Z).

Bonn, R.: The Operative Treatment of Subcapital Fractures of the Neck of the Femur (Zur operativen Behandlung der subkapitalen Schenkelhalsfrakturen). *Arch. f. klin. Chir.*, 1922, CXX, 294.

Following remarks on the mechanism of subcapital fractures of the neck of the femur, which are due to compression, bending, or rotation (the strong iliofemoral ligament plays an important part in the last two types), the causes of non-union of intracapsular fracture of the neck of the femur are discussed. These are the lack of a periosteal covering, the interposition of torn-off portions of the capsule, and poor nutrition of the fragment. The treatment may be conservative or operative, but conservative treatment has not been found as satisfactory as operative. Operative treatment consists of pegging and suturing with wire or the extirpation of the broken-off head.

The purpose of the article is to report nine cases. In two, the head was pegged on, and in seven it was extirpated after opening of the hip joint. In one of the two cases in which pegging was done, death resulted from pulmonary embolism. The other presented the picture of a pseudarthrosis after the removal of the plaster cast and the head was therefore extirpated secondarily. Of the seven other cases, four were permanently cured. It was noted that the cases operated upon early showed better results as regards weight-bearing and the gait than those operated on at a later stage. After resection of the head of the femur the attempt should be made to obtain a movable joint if the patient is young, or an ankylosis if the patient is old and stout. In the latter type of case a preliminary tenotomy of the adductor muscles should be done. RIESS (Z).

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Smeesters, E.: Paralysis of the Shoulder Girdle (Paralysie de la ceinture scapulaire). *Arch. franco-belges de chir.*, 1922, xxv, 951.

The case reported was that of a girl 15 years old who, at the age of 2 years, had an illness which was followed by temporary paralysis of the arms and legs and permanent paralysis and atrophy of the left deltoid muscles and the right shoulder girdle. Abduction, the only active movement possible in the right arm, caused forward luxation of the humerus. X-ray examination of the glenoid cavity and the head of the humerus showed a condition somewhat analogous to that in congenital dislocation of the hip due to a shallow acetabulum.

Although doubtful of the result, the author risked a tendinomuscular transplantation. He elongated the tendon of the pectoralis major, plicated the supraspinatous muscle tendons, sutured the tendon of the pectoralis minor to that of the supraspinatous, detached the deltoid from its clavicular and spinous attachments and sutured it to the trapezius, and completed the operation by an anterior capsulorrhaphy. The arm was then kept in abduction and external rotation in a plaster cast for six weeks.

When the cast was removed the patient was able to make movements with the arm which were impossible before the operation, but after a few days the luxation recurred and it was evident that the humeral head had again slipped from the glenoid cavity. Several months later the luxation was reduced by operation, arthrodesis followed by a second capsulorrhaphy was done, and the arm again immobilized. The final result was excellent.

W. A. Brennan.

Orell, S.: A Prosthesis for the Thumb (Eine Daumenprothese). *Acta chirurg. Scand.*, 1922, lv, 223.

In an accident with a saw, a man lost all the phalanges of the thumb and index finger and the proximal end of the second metacarpal bone. As he was not satisfied with the results of the operation which was done to remove the cicatrices and to deepen the fold between the thumb and index finger, an attempt was made to construct a prosthesis.

The best material for this kind of prosthesis is hard rubber. The phalanx of the apparatus was formed on the pattern of the phalangeal portion of the normal thumb with the aid of plaster negatives of the thumb, the metacarpus, and the carpal portion of the deformed hand as well as of the same parts of the normal hand. From these negatives the appliance workshop of the Zander Institute of Stockholm prepared plaster positives and negatives.

The phalangeal portion of the thumb was attached to the interphalangeal joint of the semiflexed finger. Hard rubber is suitable because of its stability and its resistance to moisture and chemical and thermic influences, and because it may be colored as desired and its surface is not too hard or fragile. A suitable, non-ductile metal wire was used as a connecting joint between the hard rubber phalanx and the carpus so that motions between the carpus and metacarpus might be transferred to the rubber phalanx. The phalangeal portion of the thumb of a male corpse was found to weigh 25 gm. The thumb prosthesis described weighs 52 gm. The free point of the prosthesis bears a flexing load of over 3 kgm. while the normal thumb bears a flexing load of more than 5 kgm. The author's thumb prosthesis meets not only the cosmetic but also the functional requirements.

Louis Neuwelt, M D.

SURGERY OF THE SPINAL COLUMN AND CORD

Cahen, I.: A Case of Backward Luxation of the Seventh Cervical Vertebra with Isolated Compression of Nerve Roots (Un cas de luxation en arrière de la vertèbre cervicale avec compression radiculaire isolée). *Arch. franco-belges de chir.*, 1922, xxv, 945.

In twenty-three cases of luxation of cervical vertebræ collected in 1912 by Henle there were no nerve symptoms in eight, temporary nerve symptoms in ten, and persistent partial paralyses in two. In Cahen's case trauma was followed by total paralysis of the right arm with intense pain and cyanosis and atrophy of the right hand. Examination of the spine three months later revealed a depression between the sixth and seventh cervical vertebræ, and the X-ray showed backward luxation of the seventh cervical vertebra. The cerebrospinal fluid was normal. Manual reduction was attempted without success.

This case presented a marked motor and sensory syndrome in the region innervated by the seventh and eighth cervical roots. For six months following the accident the paralysis decreased spontaneously but at the end of this time the improvement ceased. The patient left the hospital refusing to permit an operation to liberate the compressed nerve roots.

W. A. Brennan.

Frazier, C. H., and Spiller, W. G.: An Analysis of Fourteen Consecutive Cases of Spinal Cord Tumor. *Arch. Neurol. & Psychiat.*, 1922, viii, 455.

In the cases reviewed the final diagnosis was not established until an average of 2⅝ years had elapsed from the date of the initial symptoms. The time ranged from nine months to five years. Ten of the patients were women and four were men. Their ages ranged from 18 to 64 years. Ten were between 30 and 50 years of age.

Nine of the tumors were extramedullary and subdural, two were extradural, one caudal, one in the vertebral column, and one partly spinal and partly

intracranial. Six involved the cervical segments, three the upper thoracic segments, four the lower thoracic segments, and one the cauda equina.

In thirteen of the fourteen cases the first symptom was pain. In the single exception the tumor was extradural, and never caused pain. In the other cases the pain often occurred intermittently at intervals of days or months, and frequently was worse at night or in the early morning. In several instances it decreased appreciably at the onset of paralysis.

Table I indicates the time which elapsed between the onset of pain and the first signs of motor impairment.

TABLE I.—TIME BETWEEN PAIN AND FIRST SIGNS OF MOTOR IMPAIRMENT.*

Case	Duration of pain	Duration of motor impairment	Interval between onset of pain and motor impairment
1	5 years	2 years	3 years
2	9 months	3 months	6 months
3	1½ years	6 months	6 months
4	2 years	1 month	2 years
5	9 months	6 months	3 months
6	2 years	4 months	1⅔ years
7	5 years	2 years	3 years
8	4 years	2 years	2 years
9	3 years	2 months	2½ years
10	1½ years	3 months	1 year
11	6 years	1½ years	4½ years
12	1 year	6 months	6 months
13		2 years	
14	3 years	3 months	2½ years

* In six cases three or more years had elapsed; in two cases two years, in two cases between one and two years, and in three cases less than a year.

Pain associated with atrophy in the root distribution of the upper limb should arouse the suspicion of tumor, but if the roentgen-ray examination reveals no pathologic condition it is usually advisable to defer operation until clinical evidence of implication of the cord is noted. Exaggeration of the tendon reflexes of the lower limb, on the same side as the pain and atrophy of the upper limb, especially if associated with the Babinski reflex, is a combination that may justify early operation.

The second symptom in every case was a subjective sensory disturbance other than pain.

The Brown-Séquard syndrome in the classical syndrome of spinal tumors is represented as the second of the three cycles, the first being the root cycle, and the third, paralysis of motor and sensory function. In only five of the authors' cases were there unilateral sensory phenomena, and these were not of the Brown-Séquard type.

Motor disturbances were present in greater or less degree in most cases. Table III shows the motor symptoms, the duration of the lesion, and the relation of the tumor to the cord.

TABLE III.—MOTOR SYMPTOMS

Duration	Side	Location	Motor disability	Limb
6 months	Left	Intradural	Spastic paraplegia	
5 months	Right	Intradural	Spastic paralysis	Right leg
2 years	Posterior	Intradural	Spastic paraplegia	
3 years	Posterior	Extradural	Spastic paraplegia	
2 years	Left	Intradural	Spastic weakness	Left leg
5 months	Right	Intradural	Paresis	Right leg
1½ years	Posterior	Intradural	Spastic paraplegia	
2 weeks		Caudal		
2 years	Left	Intradural	Spastic paraplegia	
5 months	Right	Vertebral	Spastic paraplegia	
2 months	Right	Intradural	Spastic weakness	Right and left legs
4 months	Left	Intradural	Weakness	Left leg
7 months	Right	Intradural	Spastic paralysis	Right arm
3 months	Posterior	Extradural	Spastic paraplegia	

In only two of the fourteen cases was there disability in the upper extremity; in seven cases both lower extremities were involved, and in the remainder only one. The development of motor disability was in most instances (nine out of fourteen) a matter of weeks or months. This is in rather striking contrast to the period of root pains, which averaged two years. In other words, when the tumor had increased sufficiently in size to cause cord compression the motor phenomena developed rapidly.

There were only five cases with the xanthochromia phenomenon; in these the lesion was present five years, four years, three years, one year, and nine months respectively.

The Queckenstedt test, the newer test for spinal block, was not tried out in every case. This test is based upon the effect on the pressure in the lumbar puncture manometer when compression is made on the internal jugular veins. A positive finding by either method should be regarded only as confirmatory evidence of the presence of a tumor since negative findings do not preclude the possibility of such a lesion and positive findings have been noted in cases of lesions other than tumor.

TABLE II.—DISTURBANCES OF SENSATION

Case	Location	Paresthesias	Loss or impairment of sensation
1	Left lateral C 1 C 2	Absent	Unilateral Contralateral
2	Right posterolateral C 4	Unilateral Homolateral	Unilateral Contralateral
3	Left anterolateral C 4 C 5	Unilateral Homolateral	Absent
4	Right anterolateral C 3 C 4	Absent	Bilateral
5	Right anterolateral T 1	Absent	Absent
6	Right anterolateral C 8 T 1	Unilateral Homolateral	Unilateral Contralateral
7	Left lateral T 3 T 4	Unilateral Contralateral	Unilateral Contralateral
8	Posterior T 5 T 6	Unilateral	Unilateral
9	Posterior T 1 T 6	Bilateral	Bilateral
10	Right anterolateral T 8 T 9	Bilateral	Bilateral
11	Posterior T 10	Central	Bilateral
12	Right lateral T 12	Unilateral Homolateral	?
13	Posterior L 2 L 4	Bilateral	Bilateral
14	Caudal	Bilateral	Bilateral

In five cases there was difficulty in urination, and in one, occasional urinary incontinence. In three there was constipation, and in two, bowel incontinence.

In the segmental diagnosis referred pain, sensory disturbances, muscle atrophy or impairment of muscle power, and disturbed reflexes must be taken into consideration.

Table IV gives the relationship between the region to which pain was first referred and the level of the tumor.

TABLE IV.—RELATIONSHIP BETWEEN REGION TO WHICH PAIN WAS REFERRED AND LEVEL OF TUMOR

REGION OF PAIN	LEVEL OF TUMOR
Left shoulder	C_5 C_6, left
	C_7 C_8, left
Right shoulder	C_4 C_5, right
	C_6, right
Between shoulders	C_8 T_1 T_2, right
	T_1 T_8, posterior
Between angle of scapula	T_7 T_{10}, right
Right and left arm	C_8 T_1 T_2, left
Around chest	T_3 T_5, left
Back	T_4 T_7, posterior
	T_9 T_{11}, right
Epigastrium	T_8 T_{11}, left
Right leg	Caudal

In one of two instances in which sweating of the face was recorded, it occurred before operation and in the other after operation.

The Babinski reflex was recorded as present in eleven cases and absent in one.

Disturbances in the movement of the diaphragm are significant as localizing symptoms. It appears that the function of the diaphragm is not entirely dependent on the phrenic nerves.

When there have been no degenerative changes in the cord, complete restoration of function may be anticipated. In only two cases was there absolutely no return of function.

All of the tumors in this series of cases were extramedullary, and the majority were endotheliomata or fibromata—tumors with definite encapsulation and limited in size by the dimensions of the canal.

In only one of the series was removal of the growth difficult; in this instance the tumor involved both the spinal canal and the posterior fossa. At least two-thirds of the growth, a firmly fixed fibroma, was above the foramen magnum. The patient died.

In every case the tumor was exposed by removing three or four spinous processes and laminæ; in only one instance was it necessary to enlarge the opening. The cord may be rotated by traction on the dentate ligaments or gently retracted. There is no difficulty in separating the cord from the tumor or the tumor from the cord. Only after the pia is divided is the line of demarcation clearly defined. Occasionally one root, either the anterior or the posterior, may be so incorporated in the tumor that its removal may be desirable. In four of the cases one posterior root was sacrificed, and in another an anterior root.

The close adherence of the tumor to the dura makes it advisable to remove that section of the dura to which the tumor is firmly attached. Hæmorrhage from this area is quite free and can be controlled only by means of muscle grafts. With this exception, the operation is conducted in a bloodless field. After the removal of the growth, the dural wound should be closed with a continuous silk suture, and the muscle-aponeurotic structures, subcutaneous tissue, and skin with tier sutures.

The history of each of the fourteen cases is given. The article contains twenty-one figures.

CARL R. STEINKE, M.D.

Elsberg, C. A., and Stookey, B.: The Mechanical Effects of Tumors of the Spinal Cord: Their Influence on Symptomatology and Diagnosis. *Arch. Neurol. & Psychiat.*, 1922, viii, 502.

Elsberg and Stookey group tumors of the spinal cord as follows:

All growths on the posterior aspect of the cord, whether in the median line or lateral, but behind the posterior nerve roots, are classified as posterior growths. Those lying on the lateral aspect of the cord, in front of the posterior roots but behind the dentate ligament, are dorsolateral growths. Those which are lateral in front of the dentate ligament but behind the anterior roots, are ventrolateral growths. Those that lie on the anterior aspect of the cord, in the median line or more toward the side but in front of the anterior roots, are anterior or ventral growths.

In their series of cases 64 per cent of the growths were dorsal or dorsolateral, and 36 per cent were ventral or ventrolateral.

TABLE I.—RELATION OF TUMORS TO THE SURFACES OF THE CORD (NOT INCLUDING THOSE BETWEEN THE ROOTS OF THE CAUDA EQUINA)

Location	Extramedullary	Extradural
Anterior and median	1	1
Anterior and lateral	5	4
Anterolateral	6	2
Posterior and median	1	0
Posterior and lateral	18	3
Posterolateral	8	3
Lateral and posterior	1	0
Lateral or around the cord	1	1
Total	41	14

While pain is often absent, there are very few cases without some type of sensory disturbance as an early symptom.

In cases of ventral and ventrolateral growths subjective paræsthesia is very frequent.

Tumors that lie on the ventrolateral or dorsolateral aspect of the cord are much more apt to give an early Brown-Séquard type of motor and sensory disturbance than tumors in other locations. If the disease began with root pains, the tumor usually was dorsolateral; if, on the other hand, early root pains did not occur, but there were early contralateral paræsthesias, the growth usually lay on the ventrolateral aspect of the cord.

The mobility of the cord at various levels has a decided influence on the symptoms and signs of an expanding lesion within the spinal canal.

TABLE II. SENSORY SYMPTOMS AT ONSET

Symptoms	Extramedullary	Extradural	Conus and cauda	Intramedullary
None, pain	19	3	0	2
Pain in back or neck	6	4	1	4
Pain in back, extending down limbs	1	2	2	0
Pain in homolateral limb below level	1	1	0	0
Pain in contralateral limb below level	2	1	0	0
Pain in both legs below level	2	0	2	0
Pain in rectum	1	0	1	0
Pain in chest or abdomen	2	2	0	1
Tingling, burning, heaviness, pain and sensory sensation or numbness, homolateral limb below level	1	0	0	4
Tingling, burning, heaviness, pain and sensory sensation or numbness, contralateral limb below level	1	0	0	0
Tingling or numbness, both lower limbs	1	0	0	2
Tingling without pain on same side	1	0	0	0
Tingling without pain on opposite side	2	0	0	0
Numbness or heaviness, no pain	1	1	0	0
Feeling of stiffness, no pain	1	0	0	0
No sensory symptoms	1	0	2	2

The "reversed Brown-Séquard" syndrome was noted in six cases operated on. This is explained as follows: When the growth has reached a certain size and before actual pressure on the cord by the tumor has occurred, the cord has changed its position and lies against the dura and the bony wall of the canal on the side opposite that of the tumor. Two diagrams are shown to explain this condition.

In ten of the patients the symptoms and signs of the spinal compression were aggravated after fluid had been withdrawn by lumbar puncture. Three had extradural growths, and six had intradural growths firmly adherent to the dura. In one case the record was incomplete. The authors believe that if the symptoms and signs of motor and sensory disturbance become more marked after lumbar puncture with removal of fluid, the diagnosis that the growth is extradural or intradural and adherent to the inner surface of that membrane is justified.

The conclusions drawn are summarized as follows:

1. Tumors on the anterior and anterolateral aspects of the spinal cord are relatively frequent, constituting about one-third of the cases.

2. Although many patients with spinal cord tumors have no pain at the onset, the large majority have some subjective sensory disturbance as an early symptom.

3. In some cases objective sensory disturbances are absent for a long period and appear only after a lumbar puncture.

4. Tingling, coldness, burning, and other paresthesias are not rare in cases of extramedullary growths.

5. If the tingling occurs in the contralateral limb and below the level of the growth, it is probable that the tumor lies on the ventrolateral aspect of the cord.

6. Intradural tumors adherent to the dura and extradural growths not infrequently press the cord to the opposite side of the spinal canal and cause early motor symptoms on the side of the body opposite that of the tumor.

7. If the signs of motor and sensory disturbances become aggravated after lumbar puncture and the withdrawal of fluid, it is probable that the growth is either extradural or intradural and adherent to the inner surface of the dural membrane.

8. Tenderness of a spinous process at the vertebral level of the lesion points to bone disease, while tenderness of spines well below the vertebral level of the growth points to an intradural extramedullary tumor.

CARL R. STEINKE, M.D.

SURGERY OF THE NERVOUS SYSTEM

Bourguignon, G.: The Employment of Electrical Methods in the Diagnosis and Prognosis of Paralyses Due to Lesions of Peripheral Nerves. *Arch. Radiol. & Electrotherapy*, 1922, xxvii, 161.

The nerve and muscle reactions to electrical stimulation are studied in regard to: (1) the form, and (2) the quantity, of the contractions.

Theories as to qualitative reactions have remained essentially the same since the time of Erb, but those regarding the quantitative reactions have changed since the discoveries of Hoorweg, Weiss, and Lapicque established the measurement of the excitability on bases different from those of the Dubois-Reymond law which has been proved erroneous.

The Dubois-Reymond law was established on the basis of a continuous current (galvanic excitability). Faradic excitability (produced by induced waves) appears to have no relation to this law. The author summarizes the findings of experiments made by Dubois-Reymond who excited the frog's gastrocnemius muscle directly or through the sciatic nerve. The excitation was caused only at the make and break of the current and provided there was sufficient intensity. During the passage of a current of constant intensity no excitation was produced. If during the passage of a constant current the intensity was suddenly increased, these sudden variations of intensity acted respectively as a make and break of current and caused excitation. If a current was progressively made or broken, the slower the variation of intensity the greater the intensity that could be employed. With a sufficiently slow establishment of the current, excitation was no longer produced, whatever the intensity attained.

The author summarizes the law of Dubois-Reymond as follows:

1. The excitation is produced exclusively by the variation of intensity, and not by the absolute magnitude of the intensity.

2. The variation of intensity is more efficient the more rapid it is, the maximum efficiency is realized by the instantaneous make or break of a constant current.

3. The time of passage of the current and consequently the quantity of electricity and energy have no rôle in the process of excitation.

The striated muscles of vertebrates, which have a contraction of short duration, are called *muscles rapides*. Smooth muscles of vertebrates and voluntary muscles of certain invertebrates such as molluscs or crustaceans, which have contractions of long duration, are called *muscles lentes*. Fick found that progressive make or break may be made much more slowly, yet with efficiency, on *muscles lentes* than on *muscles rapides*. He found also that for short time intervals in *muscles lentes* and *muscles rapides* the intensity giving the threshold depends on the time of passage of the current, but that the time limit beyond which the law of Dubois-Reymond is exact is much shorter in the *muscles rapides* than in the *muscles lentes*. Hoorweg studied and disproved the law of Dubois-Reymond in man by the aid of condenser discharges.

Weiss used a constant current and rectangular waves of very short duration obtained by means of a pistol, whose ball, flying at known velocity, cut two wires in succession. The duration of the current depends on the distance between the two wires and the velocity of the ball. When the resistance is constant, the intensity is proportional to the voltage. Weiss showed that when the duration of the current is increased the intensity which gives the threshold diminishes to a minimum intensity which remains the same although the duration of the passage of the current continues to increase. The relations of intensity and quantity of electricity, together with the current's passage-time, constitute the law of Weiss.

Excitability cannot be characterized by the recognition of the galvanic threshold alone.

Hoorweg showed with condensers that in man the voltage necessary to obtain the threshold diminishes to a minimum value as greater capacities are employed, and the minimum value then remains constant whatever the capacity. This law of Hoorweg is applicable only to condensers.

The chronaxie of Lapicque is the time of passage of current which is constant for a given organ and characterizes its excitability. The rheobase of Lapicque is the intensity necessary to obtain the threshold of the contraction with a make of prolonged current (classic galvanic threshhold). The chronaxie is the time of passage of current necessary to obtain the threshold of contraction with an intensity double the rheobase. To know the chronaxie it is sufficient to find with a key the threshold of make of a galvanic current, and then to double the corresponding voltage and to find the time of passage of the current necessary to obtain the threshold with the voltage double that of the rheobase. If the discharge of condensers is employed, the chronaxie is the capacity which, when the current has a constant resistance, gives the threshold with the voltage double that which has given the threshold with the galvanic current.

On the basis of a study of chronaxie in animals, Lapicque formulated the following laws of general physiology:

1. The chronaxie characterizes the excitability and, with the exception of temperature, does not vary with experimental conditions.

2. A muscle and its motor nerve have the same chronaxie; this is the law of isochronism of motor nerve and muscle.

3. When the chronaxie of one of two organs varies alone, there is inexcitability by the nerve when the ratio of the nerve and the muscle passes 2. Curare modifies the chronaxie of the muscle without changing that of the nerve. Strychnine causes the chronaxie of the nerve to vary without modifying that of the muscle.

4. Chronaxie classifies the muscles of different animals as the duration of their contraction classifies them, but with more precision. While the form of the contraction depends on the physicochemical state of the muscular fiber resulting from the histologic structure of that fiber and from the physiological conditions in which it is found (cold, fatigue, etc.), the amplitude of the contraction depends exclusively on the number of fibers; it is therefore comprehensible that the chronaxie varies directly with the form of the contraction, while it is fairly independent of the amplitude. The chronaxie varies with the duration of the constraction; it changes directly as the latent period and inversely as the rhythm of the tetanus.

Examples of Lapicque's classification of muscles by chronaxie are as follows:

Muscles	Chronaxie Sec.	Duration of contraction Sec.
Gastrocnemius of the common frog	0.0003	0.15 to 1
Gastrocnemius of the common toad	0.0009	
Muscle of the snail's foot	0.0018	
Heart of the tortoise	0.0082	
Claw of the crab	0.0100	3
Stomach of the frog	1.0000	15 to 20

The author gives a description with diagrams and illustrations of the technique for the measurement of the excitability by the chronaxie of Lapicque. By this technique the determination may be made in man or animals with the same precision as in the nerve or muscle laid bare and separated from the organism. WALTER C. BURKET, M.D.

Stopford, J. S. B.: Re-suture of Peripheral Nerves. *Brit. J. Surg.*, 1922, x, 216.

This subject is of greatest importance in connection with the ulnar or median nerves. In the case of the musculospiral nerve or the sciatic nerve alternative orthopedic measures offer such good functional results that re-suture is rarely necessary.

Stopford observed fourteen cases during a period of five years. These were as follows: median nerve, five; ulnar nerve, seven; musculospiral nerve, one; external popliteal nerve, one.

Several important factors bearing upon the prognosis are:

TABLE GIVING RESULTS OF RE-SUTURE IN FOURTEEN CASES

Note—P.R.T. = Pronator radii teres; F.S.D. = Flexor sublimis digitorum; F.P.D. = Flexor profundus digitorum; F.L.P. = Flexor longus pollicis; F.C.U. = Flexor carpi ulnaris; A.M.D. = Abductor minimi digiti.

Case	Nerve injured	Site of injury	Months between date of injury and re-suture	Probable cause of failure after first operation	Result of re-suture
1	Musculospiral	Arm	40	Sepsis and intraneural fibrosis	Failure
2	Median	Elbow	13	Separation of ends	P.R.T., F.S.D., F.P.D., F.L.P. show voluntary power. Slight recovery of analgesia
3	Median	Forearm	33	Intraneural fibrosis	Failure. Subsequent amputation of hand
4	Median	Wrist	26	?	Recovery of analgesia and some recovery of anæsthesia
5	Median	Arm	14	?	All muscles show voluntary power. Recovery of analgesia
6	Ulnar	Arm	14	?	F.C.U., A.M.D., interossei show voluntary power. Recovery of analgesia
7	Ulnar	Arm	14	?	F.C.U., F.P.D., A.M.D. show voluntary power. Some recovery of analgesia
8	Ulnar	Forearm	34	Prior technique	Failure
9	Ulnar	Elbow	15	Intraneural fibrosis	Failure
10	Ulnar	Axilla	21	Intraneural fibrosis	F.C.U., F.P.D. show voluntary power
11	Ulnar	Arm	17	Sutures broke away	F.C.U., F.P.D. show voluntary power
12	Median	Forearm	79	Intraneural fibrosis	Failure
13	Ulnar	Forearm	23	Nerve-graft	F.C.U., F.P.D. show voluntary power. Recovery of analgesia
14	External popliteal	Thigh	45	Intraneural fibrosis (6 inches resected at re-suture)	Failure

1. The interval between the time the injury was received and the date of the re-suture.

2. The cause of failure after the original suture.

3. "Poor shunting."

4. The effect of a third section of the nerve trunk upon the cells of the anterior cornu and posterior root ganglion.

The conclusions drawn by the author are as follows:

1. Under favorable conditions, regeneration may occur after the re-suture of a peripheral nerve.

2. The end-results after successful re-suture are similar to those observed after successful secondary suture.

3. The causes of failure seem to be the same as in secondary suture, with the addition of: (1) greater disturbance of the intraneural anatomy by the further resection; (2) the effect of a third injury to the nerve fibers upon the cells in the anterior cornu and posterior ganglia.

4. Excluding complications, re-suture is contra-indicated: (1) when more than three years have elapsed since the time of the injury to the nerve; (2) when extensive intraneural fibrosis was encountered at the first operation.

5. The imperfect recovery of function and sensation, which is almost invariable after secondary suture or re-suture, even under the most favorable circumstances, is due chiefly to: (1) disturbance of the internal anatomy of the nerve trunk; (2) the development of intraneural fibrosis.

CARL R. STEINKE, M.D.

MISCELLANEOUS

BLOOD AND LYMPH VESSELS

DeGaetano, L.: The Etiopathogenesis, Pathologic Anatomy, Physiopathology, and Surgical Treatment of True Aneurisms (Etio-patogenesi, anatomo-patologica, fisio-pathologia e cura chirurgicale degli aneurismi veri). *Ann. ital. di chir.*, 1922, i, 593.

The method of high ligation should be reserved for cases in which better methods are not applicable.

In high ligation of the artery it is well to tie the vein also.

Up to the present time the method which has been most successful is the removal of the aneurismal sac. This procedure gives the best assurance against the development of peripheral gangrene and the persistence or recurrence of local pain.

Incision of the sac with ligation of the artery above and below before and after the incision should be resorted to only in the rare cases in which dissection of the sac is impossible.

Lateral suture is indicated after the removal of the sac only if the arterial walls near the orifice of communication are sufficiently normal to insure adequate regeneration of the vascular sheath.

Surgeons experienced in vascular surgery have been obliged to abandon obliterative endo-aneurismorraphy because of the difficulty in mobilizing the rigid thickened walls of the sac for suture.

The use of arterial or venous transplants, which is indicated more definitely in cases of false traumatic and arteriovenous aneurisms, might be attempted but requires great technical skill.

In the present state of our knowledge the surgical treatment of aneurisms should be standardized because it comes within the scope of every surgeon. All surgeons should be proficient in high ligation, the removal of the sac, and removal of the sac followed by lateral suture.

The future will show if the restorative and reconstructive aneurismorrhaphy of Matas and arterial and venous grafts offer unquestioned advantages over high ligation and extirpation of the sac.

Contrary to the general belief, injuries are not the most frequent causes of aneurisms. For aneurismic dilatation some inflammatory process is necessary. Weakness of the arterial wall may be of mechanical or inflammatory origin, but as a rule both factors are responsible. W. A. Brennan.

Silbert, S.: A New Method for the Treatment of Thrombo-Angiitis Obliterans. *J. Am. M. Ass.*, 1922, lxxix, 1765.

The fibrous scar tissue surrounding the blood vessels in thrombo-angiitis obliterans irritates the nerves or causes secondary nerve degeneration. In the lower extremity the nerves lie beside the blood vessels only below the knee. The femoral vessels do not come into contact with the sciatic nerve.

The various therapeutic measures for the relief of the pain of thrombo-angiitis obliterans include physical procedures to improve the circulation, such as baking, Bier's hyperæmia, and exercise, and surgical procedures such as arteriovenous anastomosis, ligation of the femoral vein, and the perivascular sympathectomy of Leriche. Since the sympathetic supply of the large vessels of the lower extremity comes off from the adjacent nerves at various levels along the course of the vessels, there is some doubt as to the value of perivascular sympathectomy. Favorable results from prolonged intravenous administration of sodium citrate have been reported. Meyer advocates flushing with 8 to 10 liters of Ringer's solution through a duodenal tube and supplementing this with several daily subcutaneous injections and a diabetic diet. As a last resort amputation has been done to relieve the pain.

The author advocates the injection of absolute alcohol into the nerve, as far toward the periphery as possible, and reports three cases of thrombo-angiitis which were temporarily relieved by such injection of the posterior tibial nerve at the level of the internal malleolus. When an injection into the ankle fails to give relief, one or both main nerves should be injected higher, perhaps at the lower level of the popliteal space. In order to prevent paralysis of the large calf muscles it is important to choose a level below the distribution of their nerves.

Under aseptic conditions primary union will take place in the incised, poorly nourished tissues of the ankle. Before it is injected with the alcohol the nerve is exposed and anæsthetized with procaine. Paralysis of the intrinsic muscles of the foot is a minor consideration.

The author has treated five patients by the method described. One of these cases was not suitable as extensive gangrene made amputation necessary. In another, pain in the little finger was not relieved by an injection of the ulnar nerve in the hand, being due undoubtedly to involvement of the nerve proximal to this point. Three patients have been relieved of pain in the foot for more than six months as the result of injection of the posterior nerve at the ankle.

The author does not claim that the treatment described will cure the disease but recommends it as an efficient palliative measure.

Walter C. Burket, M.D

INDUSTRIAL SURGERY

Conn, H. R.: The Acute Painful Back Among Industrial Employees Alleging Compensable Injury. *J. Am. M. Ass.*, 1922, lxxix, 1210.

Many persons erroneously yet innocently attribute non-traumatic backache to a traumatic cause because of popular opinion associating the two.

Because a backache gives no external symptoms, a patient in his anxiety to prove its existence is apt to exaggerate and claim symptoms not present. This psychological apprehension disappears if he is assured of the surgeon's belief in the presence of the condition.

The author has reviewed a series of 156 cases from an industrial hospital. In 92 per cent the pain was located in the lower back, below the level of the tenth dorsal vertebra. Certain cases were frankly traumatic while others were clearly non-traumatic. In a third group the conditions might have been due to either traumatic or non-traumatic causes. Some of the traumatic cases may have had inherent weakness also as a factor. The non-traumatic cases illustrate the necessity for a complete physical examination.

A potential group consists of cases with postural or structural deformities predisposing to symptoms in the event of trauma. This group is composed of persons with hypermobility, asymmetrical limitation of motion, or rigid immobility. In some instances the posture may indicate the defect. The patient may give no history of trauma, but may state that he changed his occupation frequently to avoid heavy work. When once the assertion of trauma has been established, the patient usually remains compensable in spite of attempts at diagnosis. The author gives a good outline of routine examination for use in dispensary work.

Sacro-iliac relaxation is infrequent and usually is brought on by sudden strain on an uninjured back.

Sacrolumbar lesions are intrinsic or extrinsic. The former are the more severe. There is usually a muscle spasm which is an attempt to straighten the exaggerated lordosis. MARCUS H. HOBART, M.D.

LEGAL MEDICINE

Malpractice in Treatment of Fracture. *Warner vs. Pence* (*N. D.*), 153 *N. W.*, p. 167.

A physician was employed to reduce a fracture of the arm. Fluoroscopic examination showed that the ulna was broken diagonally several inches below the elbow.

On account of the swelling the fracture was placed in a sling and other first-aid treatment was given. Later, attempts were made to reduce the fracture by manipulation. Nine days after the accident the plaintiff was taken to a hospital where an operation was performed; the tissues of the forearm were separated, the broken bone was placed in position and fastened with silver wire, and the arm put in a plaster cast. When the cast was removed five weeks later the elbow was stiff, and up to the time of the trial was still rigid.

The Court held the evidence was sufficient to support a judgment for the patient. The physician complained that the award of $5,000 was excessive, but in view of the circumstances the Court held it was not so large as to indicate passion or prejudice and therefore affirmed it. WILLIAM E. MOONEY.

Payment of Surgeon Withheld Because of Alleged Malpractice. *Haskell vs. Hanson* (*Minn.*), 153 *N. W.*, p. 1007.

Hanson's index finger on his left hand was cut by a saw. Dr. Haskell amputated the finger and dressed the stump. The stump healed but remained painful. Another operation was then performed. The wound healed properly and the patient did not return for treatment.

When the patient failed to pay his bill by the end of about five years Haskell brought suit for the amount due. Hanson sought to defend on the ground of malpractice, producing medical testimony that the sensitive condition was caused by the end of a nerve or a bony projection in the stump of the finger which could probably be remedied by an amputation higher up. However, no one testified that the physician had failed to operate skillfully or that the sensitiveness resulted from improper medical or surgical treatment. On the contrary it was agreed that such sensitiveness is not unusual and that another amputation would not certainly remedy the condition.

The Court discovered nothing to show that the physician failed to exercise due skill and diligence and awarded him the full amount sued for.

WILLIAM E. MOONEY.

Suit for Damages for Alleged Failure to Remove Placenta. *Krueger vs. Bottingham*, 153 (*Minn.*), *N. W.*, p. 324.

The defendant physician in this case was called to attend a woman threatened with miscarriage. As the patient was then seven miles from her home he gave the necessary treatment and took her to her home. Three weeks later a four-months-old fœtus was delivered, the physician being called a few hours afterward. With regard to the subsequent facts there was some dispute. The physician maintained that he was told that the placenta had been expelled and had been thrown away but this was contradicted by the woman's husband. At various times during the next ten days the physician was told by the husband and his wife that she had severe hæmorrhages, chills, and headache, and on each occasion he gave assurance that she would be well in a few days. Her condition then became alarming, and as he was away, two other physicians were called who caused the patient to be removed to a hospital. In the hospital, decomposed parts of the placenta were removed. The patient then improved but died sixteen days later.

The medical experts called to testify differed. Those for the physician attributed the death to embolism, while the others attributed it to septicæmia due to the presence of parts of the placenta in the uterus. The verdict of the jury was in favor of the administrator of the woman's estate.

The physician contended that Mrs. Krueger did not obey his instructions; that although he told her to stay in bed during the early treatments she attended to her household duties. There was no

evidence, however, that this was responsible for the miscarriage.

The Court held that the jury could assume that the statements made to the physician regarding hæmorrhages, chills, and headache called for treatment or action on his part, and that there was sufficient conflict of evidence as to whether the physician knew the placenta had not been expelled for the jury to determine where the truth lay. The conceded cause of the hæmorrhages which persisted so long after the miscarriage was the decomposing placenta in the uterus. The verdict and judgment were affirmed.

WILLIAM E. MOONEY.

Suit for Damages for the Alleged Leaving of Gauze in the Wound. *Paro* vs. *Carter* (Wis.), 188 *N. W.*, p. 68.

When the plaintiff was 17 years old she was operated on for appendicitis by the defendant physician. Two months later he opened the wound to discover why it did not heal properly. Soon afterward the plaintiff went to a hospital and remained five weeks, but the wound did not heal until several months later. About three years later she was troubled with pain in her foot, and after consulting the defendant twice, went to another physician whose treatment caused the disappearance of the pain within a few weeks. Subsequently the patient fainted and a few months thereafter consulted another physician, complaining of severe pain in the abdomen. Later she consulted the defendant regarding this pain and he performed an operation. Subsequently another physician and the patient's mother each removed two small pieces of gauze from the wound. Six months later another piece of gauze and a thick pasty material less than 2 in. long were removed. The wound then healed properly.

The defendant testified that the gauze sponges were counted before and after the operation.

The Court held that the operation was performed by the most approved method unless the evidence established that the gauze was not removed. Two nurses testified that an accurate count was made, and from other evidence the Court was convinced that the kind of gauze taken from the patient's body was not that used at the hospital at the time of the operation. The plaintiff was a hysteric, and it is a recognized fact that persons of this type have manipulated wounds and placed substances therein.

At least the plaintiff failed to prove by credible evidence that the defendant was responsible for the presence of the gauze later removed. Judgment for the physician was therefore affirmed.

WILLIAM E. MOONEY.

GYNECOLOGY

UTERUS

Cullen, T. S.: The Use of Sutures as Tractors in the Vaginal Operation for Prolapsus. *Am. J. Obst. & Gynec.*, 1922, iv, 544.

The author uses chromic catgut sutures as tractors in the vaginal operation for prolapsus. These sutures are of the figure-of-eight type and are placed in the body of the uterus after the vesico-uterine peritoneum has been opened. They are all tied, each successive lowest one being used as a tractor. The ends of the suture are then rethreaded, carried through the peritoneum and vaginal wall, and left untied until the cervical stump is amputated and the vaginal mucosa is sewed to it by figure-of-eight sutures. The results of this method have been excellent.

The article is well illustrated.

E. L. Cornell, M.D.

Nyulasy, A. J.: Restoration of the Round Ligaments in Retroversion of the Uterus. *Med. J. Australia*, 1922, ii, 517.

The author splits the anterior peritoneum parallel with the round ligament and a little toward the bladder side, undermines the edges, and closes the opening with a pursestring suture. The outer limit of the suture is near the internal abdominal ring and the inner limit near the uterine cornu. This procedure pulls up the slack in the broad ligament as well as that in the round ligament. Nyulasy has used it in a number of cases with very good results.

R. E. Christie, M.D.

Huggins, R. R.: Pre-Cancerous Conditions of the Cervix Uteri. *Am. J. Obst. & Gynec.*, 1922, iv, 552.

Erosion used to be called an ulcer, a term indicating a loss of tissue, but as in reality there is an increase of tissue in this condition, it should be described as a sessile adenoma. The vaginal portion of the cervix is normally covered with many layers of a squamous epithelium continuous with that of the vagina. At or near the os externum the epithelium suddenly becomes cubical and is in fact the columnar glandular epithelium which lines the cervix and the body of the uterus and consists of a single layer of tall cells. These cells are continuous with the glands of the cervix which are numerous and lined with a single layer of columnar epithelium. The glands of the cervix are more complicated and larger than the glands of the uterus. In fact, the cervix is itself a gland and a structure quite apart from the body of the uterus. It is in connection with these glands of the columnar glandular epithelium lining the cervical canal that the pathology of erosion is of interest.

The red patch which is so typical is due to an overgrowth and hypertrophy of the columnar cells lining the cervical canal which spread over and grow through the squamous epithelium normally covering the vaginal portion of the cervix. It is caused, not by destruction of tissue, but by the replacement of deep columnar cells over a wider area than normal. The bright red color is due to the fact that the surface is covered by only a single layer of cells which allows the bright color of the underlying blood vessels to show through. If a return to the normal occurs it comes from the removal of this surface by the normal squamous cells of the vaginal mucous membrane. When this happens the deep cells, glandular in type, become buried and covered over. Their natural function being to secrete, the formation of cysts is easily explained. Masses of small mucous cysts may occupy the surface of an erosion or extend deeply into the tissue of the cervix. The marked tenderness so often noted in this condition indicates inflammatory change.

The presence of cysts scattered throughout the cervix is common but their extent is often not appreciated until it is revealed by amputation or incision.

Every woman who has borne children and has reached the age of 40 years should be examined for disease of the cervix. If such disease is found it should be treated. In some cases the treatment may be palliative, but often should consist in the removal of the diseased tissue. It must be borne in mind that cancer begins in a small way, perhaps in one single cell, and that while the cervix may present but slight evidence of disease, this may be sufficient in the presence of susceptibility and an acid medium to cause cancer.

E. L. Cornell, M. D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Sampson, J. A.: The Life History of Ovarian Hæmatomata (Hæmorrhagic Cysts) of Endometrial (Muellerian) Type. *Am. J. Obst. & Gynec.*, 1922, iv, 451.

Next to leiomyoma of the uterus, the pathologic conditions arising from the implantation of epithelium which escapes from the fallopian tubes into the peritoneal cavity are probably the most common pelvic lesions found in women between the ages of 30 and the menopause. During the last year thirty-seven cases of such lesions were found by the author in 170 abdominal operations for pelvic conditions in women between 30 and 50 years of age. If the epithelium escaping from the tube falls on suitable tissue, it develops into glands or tubules of endometrial (muellerian) type which generally react to menstruation. These adenomata are usually found

on the structures which are most frequently in close contact with the fimbriated ends of the tubes, such as the lateral and under surfaces of the ovaries and the peritoneal surface of the structures in the cul-de-sac. Implantation adenomata may occur only on the surface of the ovary or ovaries, both in the ovaries and on the pelvic peritoneum, or on the pelvic peritoneum alone.

The primary peritoneal implantations are usually small and insignificant but may spread and become invasive.

The implantations on the ovary invade the tissues of that organ and, as a result of their reaction to menstruation, develop into superficial or deep hæmatomata (hæmorrhagic or menstruating cysts) of endometrial (muellerian) type. The casting off of all of their epithelial lining by menstruation may cause their destruction before perforation occurs, but most of them rupture or perforate into the peritoneal cavity. Perforation occurs in the superficial ovarian hæmatomata while they are still small, a few millimeters in diameter, and as the result of menstruation and perforation the entire epithelial lining may be cast off and the hæmorrhagic cyst may disappear.

The hæmatomata developing in the deeper tissues of the ovary may attain a large size, several centimeters in diameter, before perforation occurs. As the menstrual blood is retained in the cavity of the hæmorrhagic cyst and in the stroma of its lining for a long time, many interesting histologic changes occur in the wall of the cyst in the attempt to absorb the menstrual blood and to reline the denuded surfaces by epithelium from that which had not been removed by menstruation. The development and activities of the endothelial leucocytes, which act as scavengers, play an important part in the absorption of the menstrual blood and the deposit of pigment derived from this blood in the walls of the hæmatoma. Perforation permits the contents of the hæmatomata to escape into the peritoneal cavity, and temporarily relieves the embarrassment caused by its retention. The perforation is sealed by the adherence of the ovary or cyst to adjacent structures. The hæmatoma again fills up with blood at its reaction to menstruation, and repeated perforations may occur. As the reaction to menstruation is destructive, and as the repair and regeneration of the epithelial lining is accomplished under great difficulties because of the retention of the menstrual blood, the ultimate tendency of the hæmorrhagic cyst is retrogression.

In its reaction to menstruation portions of the epithelial lining are cast off into the cavity of the hæmatoma, and therefore may be found lying free in its hæmorrhagic contents. Adenomata of the endometrial type may be on the surface of the ovary about the perforation and in the tissue of the structures adherent and adjacent to it as well as in situations where the material escaping through the perforation lodges. This indicates that these adenomata may be derived from the implantation of epithelium cast off by menstruation into the cavity of the hæmatoma and escaping through the perforation. Implantations may arise from small as well as from large ovarian hæmatomata; generally the larger the hæmatoma and apparently the larger the perforation, the wider the distribution of the implantations. These secondary implantations often resemble normal endometrium more closely than the epithelial lining of the original ovarian hæmatoma and are often more invasive and more closely resemble normal endometrium than the implantations found in the pelvis without evidence of an ovarian hæmatoma with perforation, i.e., those resulting from a primary implantation from or through the tube. For these reasons the author believes that in the development of pelvic implantation adenomata of endometrial type the ovary is an incubator or intermediary host, which in some instances may possibly impart greater virulence to the epithelium developing in it. However, it is not an essential intermediary host in the origin of all implantation adenomata of endometrial (muellerian) type.

It is possible that primary ovarian and peritoneal implantations (those developing from epithelium escaping from the fallopian tube) arise from both tubal and uterine epithelium. This was suggested by the specimens studied by the author. Histologically these implantations may be divided into three groups. The first are those consisting of glands or tubules and dilated tubules which often are lined by ciliated epithelium and are without the characteristic stroma of normal endometrium, or show stroma poorly developed. The structure resembles that of the mucosa of a primary adenomyoma of the tube and strongly suggests that the implantations might have been derived from the epithelium of the fallopian tube. In the second group the adenomata consist of stroma and glands similar to those of normal endometrium. The histologic picture strongly suggests that these were derived from uterine epithelium escaping through the lumen of the fallopian tube, i.e., from menstruation with a back-flow into the peritoneal cavity or from portions of tubal mucosa which had reacted to menstruation. In the third group the picture suggests a mixture of adenomata of tubal and uterine type or represents transitional stages from one to the other.

The epithelium of the ovarian hæmatomata or hæmorrhagic cysts may also suggest either a tubal or a uterine origin.

In cases with implantation adenomata in the pelvis associated with an ovarian hæmatoma showing evidence of perforation both primary implantations from or through the fallopian tubes and secondary implantations from the ovarian hæmatoma may be present, but the latter probably predominateas a rule.

It is difficult to determine the factors which favor the implantation and growth of tubal and uterine epithelium on the surface of the ovary and on the peritoneum. As implantations result from the per-

lation of the ovarian hæmatoma containing menstrual blood, this may be an important agent in facilitating the development of these implantations. Therefore menstruation with a back-flow through the tubes into the peritoneal cavity may be an important contributory factor. The implantations are frequently found in patients with retroflexion of the uterus, leiomyomata, and uterine polyps, conditions which, when the tubes are patent, might favor retrograde menstruation.

The reaction of the lining of ovarian hæmatomata of endometrial type to menstruation, pregnancy (one case), and old age (two cases), was similar to that of the uterine mucosa.

The author believes that the implantation adenomata in the ovary derived from tubal and uterine epithelium are the source of many ovarian cysts and carcinomata and is convinced that two of the latter in the cases studied arose from this source.

E. L. Cornell, M.D.

Hoon, M. R.: Solid Carcinoma of the Ovary. *Ann. Surg.*, 1922, lxxvi, 768.

Thirty-seven cases of solid carcinoma and two cases of solid sarcoma of the ovaries were found in the examination of malignant tumors of the ovary at the Mayo Clinic between January 1, 1910, and August 1, 1921. These tumors were solid throughout or contained only relatively small cysts due to degeneration and necrosis or retention. All cases of benign or malignant ovarian cysts, dermoids, etc., were excluded. As during the same period of time 4,175 tumors of the ovary were removed, the malignant tumors constituted 0.93 per cent of all ovarian neoplasms. During the same period 540 malignant ovarian tumors were removed, and of these 0.086 per cent were solid.

The most common symptoms were pain, tumor, ascites, loss of weight and strength, anorexia, and bladder and rectal disturbances. Pain, which was present in thirty cases, varied in type and location. As a rule it was located in the lower abdomen and pelvis, but occasionally occurred in the lumbar or sacral region of the back and radiated down the groin. It was usually described as a constant dull ache or a bearing down or dragging sensation. Occasionally it was sharp and severe because of twisting of the pedicle; it then resembled the colic due to renal or ureteral calculus. Twenty-two of the patients had tumors. In twenty cases the tumor was discovered by the patient herself, in seven it was discovered by the family physician, and in ten it was not discovered until the time of examination at the Clinic. The general health of thirty-five of the patients was below normal or very poor. Eighteen had a loss of weight ranging from 5 to 36 lbs. Frequency, burning, painful urination with pelvic pain, and pressure were the most common symptoms.

Physical examination usually revealed the tumor in the pelvis. Often it extended above the brim, and at times it almost filled the entire abdomen. Fixation in such cases may be due to extension of the growth to the pelvic wall or adjacent viscera, or to inflammatory adhesions. The blood picture shows varying degress of secondary anæmia as in malignancy in other parts of the body.

The clinical diagnosis of solid carcinoma of the ovary is rarely made definitely. As a rule the surgeon must wait for the pathologist's diagnosis. The differential diagnosis includes the consideration of benign and malignant ovarian cysts, ovarian fibromata and dermoids, fibromata of the uterus, retroperitoneal tumors, and tumors of a displaced kidney.

Exploratory operation should be offered to all patients, even when there is ascites, unless metastasis can be definitely demonstrated. Palpation of an enlarged nodular liver, enlarged hard inguinal or pelvic glands, or extension with induration of the broad ligaments indicates a condition which cannot be relieved by operation. Roentgenograms of the chest and pelvic bones make it possible to detect metastasis to these regions. When metastases are present, radium and the roentgen ray may temporarily relieve the pain and suffering and prolong life for a short time. Periodic abdominal paracentesis may be necessary on account of the re-accumulation of fluid. In cases suitable for surgery postoperative applications of radium in the vagina and rectum and applications of the roentgen ray to the abdomen and back are of value if recurrence is feared because it was impossible to remove all of the malignant tissue. When recurrence takes place, radium and the roentgen ray are of little value even as palliative measures.

The prognosis of solid carcinoma of the ovaries is comparatively poor. Formerly, this tumor was believed to be relatively benign, but recent writers agree that it is more malignant than was indicated by previous reports. Of the patients whose cases are reviewed in this article only three were living and well after the five-year period, the length of time since the operation being five and one-half, seven and one-half, and nine years respectively. Two were living and well after three years, two after two years, two after eighteen months, and two after ten months. Six patients died within six months, nine within one year, and four within two years.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Norris, C. C., and Murphy, D. P.: Pregnancy in the Tuberculous; with the Report of 166 Cases. *Am. J. Obst. & Gynec.*, 1922, iv, 597.

The conclusions drawn by the authors on the basis of the 166 cases reviewed are as follows:

1. The combination of pregnancy and pulmonary tuberculosis is common.

2. Pulmonary tuberculosis exerts little or no influence against conception.

3. Pulmonary tuberculosis exerts but little influence on the course of pregnancy, and except in the advanced stages exerts little or no influence toward causing abortion, miscarriage, or premature labor.

4. About 20 or 30 per cent of cases of mild, quiescent pulmonary tuberculosis and 70 to 90 per cent of more advanced cases exhibit exacerbations during pregnancy or the puerperium.

5. Marriage is worse for the tuberculous woman than for the tuberculous man because of the dangers incident to pregnancy.

6. Unless the pulmonary lesions have been quiescent for a moderately long period, the tuberculous woman should not marry.

7. Tuberculous women should not become pregnant unless the disease is in the first stage and has been quiescent for a minimum period of two years.

8. It is as yet impossible to determine with certainty which case will bear the added strain of pregnancy well and which will not. Moderately extensive lesions, extension, especially to the larynx, loss of weight, fever, hæmorrhage, sweats, lack of vigor, and inability to obtain proper treatment are unfavorable.

9. Prior to the fifth month of pregnancy the uterus should be emptied if there is any indication that the disease is becoming active. Curettage during the first six or eight weeks, and in the later cases vaginal hysterotomy are the methods of choice. It must be remembered, however, that abortion can be induced without the induction of general anæsthesia and that the necessity for the use of a general anæsthetic in vaginal hysterotomy may outweigh the advantages of the procedure.

10. About 65 to 70 per cent of suitable cases will be benefited by this treatment provided it is employed as soon as acute symptoms arise and proper after-treatment is instituted. Late intervention, i.e., a week or more after the onset of the exacerbation, has given less satisfactory results.

11. Sterilization is not justifiable as a routine procedure. Furthermore, as a routine procedure it is not advisable as in many cases it will be more expedient to empty the uterus without the use of an anæsthetic. Apart from the dangers of a general anæsthetic, sterilization prolongs the operation and generally adds to its gravity. If the patient's condition is poor, it is useless, and if she improves, as a result of the emptying of the uterus, it is better to perform the sterilization at a later date when she is in better condition.

12. After the fifth month of pregnancy it is generally advisable to treat expectantly. Labor should be made as easy as possible. The induction of labor two weeks before term may be advisable; rarely, if ever, should the patient be allowed to go beyond term. During labor the use of forceps or version is often indicated.

13. Infants should not be allowed to nurse from tuberculous mothers, and should be especially guarded from infection.

14. Hygienic and dietary treatment should be employed at all times. The patient should be kept under close observation and examined by a competent internist at regular and frequent intervals.

15. In the great majority of cases, even in those in which the symptoms are first observed during pregnancy, the tuberculosis preceded the pregnancy.

E. L. Cornell, M.D.

LABOR AND ITS COMPLICATIONS

Haskell, C. C., and Rucker, M. P.: The Action of Ergot and Solution of Hypophysis on the Uterus. *Am. J. Obst. & Gynec.*, 1922, iv, 608.

From the findings of experiments it seems fairly safe to conclude that pituitary solution affects the uterus of the cat and the dog more powerfully than ergot and is more apt to cause either tetanus or an increase in tone which is similar in its effect on intra-uterine pressure. Therefore in the early stages of labor it is more dangerous than ergot.

In no clinical case did the use of ergot elicit tetanic contractions of the uterus in the first stage of labor. This is at such variance with expectations based on clinical experience that the authors are at a loss to interpret their results. At first they were inclined to assume that the drugs used were inert, but this was disproved by testing them upon animals and by the fact that the results obtained with other lots of ergot were practically the same. They therefore conclude that there is a great deal of variation in the response of human uteri to ergot and pituitary solution and that the disastrous results sometimes following the use of these drugs occur in cases in which the uterus is particularly sensitive to their effects. The authors have found such uteri in their work with animals. A certain number of cases may be attributed to the sensitization of the uterus by repeated doses of ergot as

noted by Edmunds and Hale. The authors have seen no such phenomenon in clinical cases but in the laboratory have noticed a marked variation in the response of the same uterus to ergot.

Next to the ease and promptness with which a tetanic contraction of the uterus is elicited by pituitary solution, the most interesting feature of the action of this drug is the variation in the latent period. It has often been noted clinically that the effect of the solution is the more prompt and energetic the closer the patient is to term. This has been borne out by the authors' observations. When it was necessary to induce labor in the seventh month the latent period was four minutes, while at term it was two minutes. In the third stage six minutes elapsed after the injection of the solution before a response was noted, while after the delivery of the placenta the latent period was eight minutes.

The authors' conclusions are as follows:

1. It can be readily demonstrated by animal experimentation that the action of ergot and pituitary solution upon the uterus is the same if the doses of ergot used are sufficiently large.

2. The action of pituitary preparations is much more powerful than that of ergot. This is readily shown both by experiments upon animals and observations in clinical cases.

3. It is a common clinical finding and abundantly proved by laboratory experiments that the action of both drugs varies greatly in different persons.

E. L. Cornell, M.D.

Kosmak, G. W.: Intra-Uterine Rupture of a Velamentous Umbilical Cord. *Am. J. Obst. & Gynec.*, 1922, iv, 619.

A primipara in the eighth month of pregnancy had gone through a mild degree of toxæmia of the nephritic type which had responded favorably to treatment. The placenta presented infarct formation which undoubtedly led to its separation. The administration of castor oil was probably a contributory factor. With the separation of the placenta there was laceration of a portion of the velamentous cord. It is probable that the sudden gush of blood came from the placenta as there was insufficient dilatation of the cervix and no evidence of placental separation at the lower pole to account for a hæmorrhage of this severity. A fact of interest is that the patient did not experience the pain usually associated with premature separation of the placenta. The baby died from asphyxia due to the intrauterine hæmorrhage from the cord. The velamentous cord was inserted at the upper pole of the placenta whereas in most of the reported cases this anomaly was present in the region of the cervix and rupture occurred as the cervix dilated. The patient made an uneventful recovery after cæsarean section. The wound healed by primary union and there was no shock. Subsequent examination of the urine disclosed nothing abnormal.

The frequent association of velamentous cord insertion with placenta prævia should be borne in mind. Irregular bleeding at the end of the first stage of labor should lead us to suspect this condition if a lateral placenta was believed to be present and was not found on careful examination, especially when the presenting part is well engaged.

With regard to the treatment the author states that when the accident occurs in primiparæ and is associated with such a severe hæmorrhage as in the case reported, due to another cause, cæsarean section is the method of choice.

E. L. Cornell, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Piper, E. B.: The Treatment of Puerperal Sepsis by the Use of Mercurochrome Intravenously; With a Report of Animal Experimentation in Chemical Disinfection of the Blood. *Am. J. Obst. & Gynec.*, 1922, iv, 532.

A 1 per cent solution of mercurochrome is prepared with sterile distilled water. As it has been shown by other investigations, which the author's experience corroborates, that the drug soon loses its strength, it is always freshly prepared just before it is to be used and put up in 30- to 50-c.cm. ampules. The solution should never be employed unless it is absolutely clear. It is injected very slowly by means of a fine needle and a large syringe at a temperature as near 100 degrees F. as possible. Formerly the patient was given a dose of magnesium sulphate at the end of twelve hours, but this is no longer done as it appears to eliminate the drug before it has a chance to exert its germicidal effect. Heat is applied externally for the chill, and bismuth mixture is given as an intestinal sedative to overcome the diarrhœa if it continues long. A careful record of the excretion of urine is kept. The administration of the mercurochrome may be repeated, but is never done as long as there is any sign of dye in the urine or fæces. As many as five doses have been given. Occasionally salivation occurs.

The reaction following the intravenous injection of mercurochrome is analogous to that oberved after the introduction of serum, bacteria, or sterile milk by a similar route and can probably be explained in the same way. Some of the action of the drug may be due to the immobilization or inhibition of the circulating bacteria; possibly also to their direct destruction by the drug, as in the test tube, aided by the increase in the leucocytes which always accompanies a reaction following an injection. It is possible also that mercurochrome reduces the number of circulating organisms by combating them where the infection localizes. The chemical is of the greatest value in local infection.

The conclusions drawn by the author are as follows:

1. There are certain cases of puerperal septicæmia so fulminating and virulent that no treatment can save life.

2. The use of antistreptococcus serum has appeared to be of great value in some cases. Frequently

repeated small blood transfusions and certain methods of intravenous medication are of benefit.

3. A solution of mercurochrome given intravenously in the proper dosage appears, in some cases, to be of great value and to have no deleterious effects.

4. Puerperal septicæmia is so serious that heroic measures are justified. E. L. CORNELL, M.D.

Bruett, H.: The Surgical Treatment of Puerperal Gas Bacillus Infection of the Uterus: Physometra: (Beitraege zur Kenntnis und zur chirurgischen Behandlung der puerperalen Gasbrandinfektion des Uterus: Physometra). *Arch. f. Gynaek.*, 1922, cxvi, 1.

The pathologic anatomy and the clinical aspect of gas bacillus infection of the uterus are described in detail on the basis of six cases. Frænkel's bacilli were demonstrated as the excitants in every instance. Removal of the uterus resulted in a cure in only one case.

The typical clinical picture of general gas bacillus infection with pronounced icterus was present in only one case. In three cases icterus was entirely absent in the beginning, but appeared in the subsequent course of the disease. In one case the gas bacilli were not demonstrated in the blood until just before death. In many cases the urinary findings are of great importance in the diagnosis. In very severe cases the urine is almost black and has the consistency of varnish. It may also contain gas bacilli. The route of dissemination of the gas bacillus is almost exclusively along the lymph channels.

The prognosis of surgical treatment in cases of puerperal gas bacillus infection may be considered as relatively favorable if general infection does not result. In gas bacillus peritonitis without general infection the results of drainage are not entirely unfavorable, but in general gas bacillus infection without symptoms of peritonitis operative interference is usually futile. THALER (Z).

NEWBORN

Joyce, C.: Patent Foramen Ovale. *Med. J. Australia*, 1922, ii, 529.

The author reports two cases of patent foramen ovale. One was that of a female child of six months who had severe bronchitis with a patch of pneumonia at the base of the right lung. Cyanosis had been present since birth. A systolic murmur was heard all over the chest and the apex beat at the fifth interspace on the right side. The abdominal viscera were in normal position.

The other case was that of a girl of 9 years who had always been very poorly nourished and when examined by the author was extremely emaciated. This patient also had been cyanosed since birth. A diagnosis of pneumonia of the right lung and a patent foramen ovale was made.

In the first case only water was given during the febrile period, and in the second only water and orange juice were allowed. Both patients recovered. The author states that he has never regretted the use of the starvation method of treatment during the febrile stage of disease. R. E. CHRISTIE, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Keller, O.: Traumatic Subcutaneous Rupture of the Kidney (Sur la rupture sous-cutanée traumatique du rein) *Arch. d. mal. d. reins et d. organes genitaux urinaires*, 1912, i, 137.

Subcutaneous traumatic rupture of the kidney is a rare lesion, being found in less than 1 per cent of surgical cases. According to Keller, the records of the Municipal Hospital at Copenhagen show forty-three cases in a total of 83,000 surgical cases treated during the last twenty-six years. The right kidney appears to be more frequently involved than the left, and the condition occurs much more frequently in men during the working years than in women or children.

The rupture may be direct or indirect. The majority of the cases referred to by Keller are direct injuries. A direct rupture is due to compression of the organ by the thoraco-abdominal wall and associated internal hydraulic pressure in the kidney. Frequently the twelfth rib is fractured by its compression against the transverse process of the first lumbar vertebra.

The lesions may be classified according to their degree and extent as: (1) superficial lesions of the capsule and cortical substance not involving the calices; (2) ruptures involving the calices or the pelvis, which are generally localized on the posterior surface of the kidney; (3) complete crushing of the kidney, which is generally associated with other severe injuries; (4) injuries of the pedicle or the pelvis, which are often combined with some of the foregoing conditions.

The most common complication is fracture of the twelfth rib, but other ribs also may be fractured. Another common complication is peritoneal rupture with the discharge of blood and urine into the cavity.

The general symptoms of syncope and shock mask the local symptoms. In many cases, even when the injury is severe, the subject may be able to walk and to work. On the other hand, a slight rupture may be followed by immediate collapse. Vomiting may be the first sign of peritoneal injury. The local signs are a skin abrasion at the point of injury, swelling in the lumbar region, and dullness on palpation when an effusion collects. The kidney is sensitive to pressure and the pain is lancinating and colicky.

Hæmaturia occurred in 95 per cent of the reported cases. It does not indicate the extent of the hæmorrhage, and in the extremely serious cases, such as those in which there is a total rupture of the pedicle or the ureter or the pelvis of the kidney is obstructed by clots, it may not be observed. Traumatism may be followed by polyuria or complete anuria.

When hæmaturia is present it may be very difficult to refer it to the kidney rather than to the bladder unless there are other symptoms. On account of the risks of infection, cystoscopy is justified only in cases which are to be operated upon immediately. Hæmaturia therefore is of only relative value as an indication of the gravity of the condition; perirenal tumefaction and effusions are of greater importance.

According to different authorities, the mortality of non-complicated traumatic subcutaneous rupture of the kidney varies from 15 to 27 per cent. The two principal dangers are hæmorrhage and infection, which are responsible for 45 and 4 per cent of the deaths respectively.

Up to 1876 the treatment was usually non-operative. The first nephrectomy for this lesion was done in 1883. Slight injuries should be treated conservatively, operation being reserved for those which are in immediate danger.

In 478 conservatively treated cases reported in the literature up to 1908 there were sixty deaths from hæmorrhage, thirty-eight from infection, and nine from other causes. The opinions of surgeons vary greatly as regards the indications for operation and the time at which it should be performed. In the conservative treatment the risks of hæmorrhage, infection, and other complications are greater than in operative treatment.

The majority of surgeons do not hesitate to operate when a peritoneal injury is associated with the renal injury. The most auspicious time is immediately after the cessation of the initial shock. Nephrectomy is indicated in cases of: (1) pedicle lesions causing trophic disturbances; (2) extensive infection; (3) contusions destroying all functional tissue; and (4) lesions necessitating a quick operation. Conservative operation consists of tamponing, suturing, and drainage, or nephrotomy.

Short histories of forty-three cases collected by the author are given. In six of these cases in which a nephrectomy was done there were two deaths. Two patients treated by nephrotomy recovered. In the thirty-five cases not operated upon there were four deaths.

W. A. Brennan.

Eggers, H.: The Surgery of Horseshoe Kidney (Zur Chirurgie der Hufeisenniere) *Ztschr. f. urol. Chir.*, 1922, ix, 447.

The number of cases in which anatomically non-pathologic horseshoe kidneys are divided in the presence of the Rorning syndrome is increasing. In the case reported by Eggers the symptoms pointed to a concretion and infection in the pelvis of the left kidney. A malformation of the kidney was not suspected. After the removal of the stones by

pyelotomy it became apparent that the ureter passed over the lower pole of the kidney and that nephropexy was indicated to improve excretion. The left kidney was connected to the right by an isthmus 3 cm. wide and 0.5 cm. thick.

The division was done without difficulty with the use of two clamps and cauterization of the cut surfaces with the Paquelin cautery. From the drain there was only a slight transient discharge with a urinous odor. The kidneys did not rebound to the normal sites after their division, as in Rossing's case. A subsequent pyelographic examination revealed dilation of the right renal pelvis and a low position of the kidneys. Fixation of the right kidney was not attempted during the operation because it was regarded as advisable to await the operative result on the left kidney on account of the presence of a urinary infection. The result was completely successful on the left side but on the right side there was incarceration of the kidney which required correction by nephropexy.

The author assumes that the abnormal course of the ureter at least favored, if it did not cause, the dilation of the pelvis of the right kidney and the stone formation in the left. Therefore in every case of pathologic horseshoe kidney the course of the ureters should be determined and unless a serious lesion necessitates the extirpation of one-half of the kidney the division of the isthmus should be followed by nephropexy. JANSSEN (Z).

Wossidlo, E.: Cystic Kidney (Zur Cystenniere). *Zeitschr. f. urol. Chir.*, 1922, x, 385.

Three cases of cystic kidneys are reported. The clinical symptoms were mainly renal hæmorrhages and colicky pains. The bleeding kidney was extirpated in every case and the patient survived the operation for several years in spite of the fact that the other kidney also underwent cystic degeneration.

The first case was that of a man 39 years old who had a slowly growing tumor in the right kidney region. Cystoscopic examination showed blood in the urine coming from the right ureter. At operation the moderately enlarged organ was found to be completely infiltrated by cysts. None of the cysts was larger than a walnut. One of them contained a stone. The renal pelvis and ureter were negative. Four years later the patient was clinically well but the formerly impalpable left kidney had become distinctly palpable.

The second case was that of a woman 48 years old who had a sudden severe hæmorrhage and repeatedly passed small concretions. On the left side was a nodular tumor as large as an infant's head. Cystoscopic examination revealed normal urine coming from the right ureter and pure blood from the left. A left nephrectomy was done. The kidney removed was markedly cystic and showed only slight amounts of parenchyma. The remaining kidney functioned normally soon after the operation, but in the succeeding weeks grew rapidly and became visible in the roentgenogram as a large shadow. Soon thereafter the severe colics associated with hæmorrhages recurred. The patient was still alive three years after the operation, but occasionally had severe clinical symptoms.

In the third case hæmaturia and a renal tumor on the left side were the first indications of the condition. The cystoscope revealed blood issuing from the left ureter. The urine from the right ureter was normal but the right kidney was palpable as a distinct tumor. Removal of the left kidney was followed by recovery. Nine months later the enlargement of the right kidney had increased considerably. Pneumoradiography revealed a large renal tumor with pronounced multiple humps. Transient, slight renal hæmorrhages occurred. Two years after the operation, the patient was still alive but the symptoms persisted.

Regarding the indication for operation in this type of case Wossidlo takes the position that surgical interference is indicated only by hæmorrhage which threatens life and then only if the other cystic kidney is functioning properly. The correct diagnosis can be made in early cases by pneumoradiography of the kidney bed. Careful histologic study is important as a true tumor growth may be associated with the cyst formation.

BRUETT (Z).

DeBerne-Lagarde, R.: The Histologic Lesions of Experimental Aseptic Hydronephrosis (Les lésions histologiques de l'hydronéphrose expérimentale aseptique). *Arch. d. mal. d. reins et d. organes génitaux-urinaires*, 1922, i, 168.

The majority of writers consider the nephritis of experimental hydronephrosis as due to the epithelial lesions, but others attribute it almost exclusively to the mechanical factor and regard proliferation of connective tissue as a direct result of infection. English and American pathologists consider the vascular elements of great importance.

The author has caused experimental hydronephrosis in white rats by obliterating the ureters. He obtained aseptic hydronephrosis in six of fourteen such experiments, hydronephrosis with slight infection in three, pyonephrosis in two, suppurative hæmatonephrosis in four, and renal atrophy in one. This experimental work led to the following conclusions:

1. The histologic lesions observed in a kidney attacked by aseptic experimental hydronephrosis evolve in two successive phases: (1) mechanical distention of the tubes by the retained urine, a distention which is unequally distributed in the tubes; (2) atrophy of the wall of the tubes. If in this second phase the connective tissue predominates, the cause of it resides alone in tubular atrophy. Up to the last period the glomeruli remain intact.

2. In cases of aseptic experimental hydronephrosis the other kidney remains entirely normal.

W. A. BRENNAN.

Blum, V.: The Diagnosis of Small Concretions in the Renal Pelvis and Ureter (Zur Diagnostik kleiner Konkremente im Nierenbecken und Harnleiter). *Zischr. f. urol. Chir.*, 1922, x, 528.

In cases of stones in the kidney and ureter the number of incorrect and doubtful diagnoses based on roentgenograms is no greater than 2 to 5 per cent, but it is just in these cases that the determination of the renal disease and the causes of the attacks of pain is most difficult.

The demonstration of concretions depends upon the shadow picture in the plate, the identification of the shadows as those of renal and ureteral stones, and the accurate determination of the position of the stones. A stone may be invisible in the roentgenogram because of its small size or its chemical composition, because it lies in a cavity filled with fluid, or because there is an excessive development of fat in the region of the kidney.

Conditions causing shadows in the kidney region and along the course of the ureter which may lead to errors in diagnosis include calcified glands, phleboliths, calcification of the pelvic ligaments, artefacts in the roentgen plate, and foreign bodies in the intestine.

Concretions smaller than a caraway seed are difficult to find in the roentgenogram if the subject is fat, but may be the cause of typical colic and hæmaturia.

In every pyelotomy for a visible concretion the entire surgical pelvis of the kidney should be sounded with suitable instruments in order that all small concretions present may be discovered. Uric acid stones, which are permeable to the rays, may be demonstrated by impregnating them with collargol (Kuemmell), by inflating the renal pelvis with air, and by pneumoradiography of the kidney bed. As stones in a cavity filled with fluid may escape roentgenological demonstration, a second examination should be made after the residual urine has been emptied from the renal pelvis and the bladder.

In every case in which clinical observation suggests the possibility of stone formation the combination of radiography with the introduction of a shadowgraph catheter and pyelography is recommended for the identification of suspicious shadow formations with stones lying in the region of the kidney and in the course of the ureter.

GRAUHAN (Z).

Ciminata, A.: The Transplantation of Free Muscle into the Nephrotomy Wound (Freie Muskeltransplantation in die Nephrotomiewunde). *Zischr. f. urol. Chir.*, 1922, iv, 433.

Of the various operations on the kidney nephrotomy is followed by the greatest number of fatalities from secondary hæmorrhage. The incisions planned to avoid section of blood vessels (Zondeck, Hauch, Marwedel) have not been successful in improving the conditions. The statistics of Tschaika based on ninety cases of secondary hæmorrhage after nephrotomy show that secondary nephrectomy was necessary in forty-one cases, and in spite of this procedure eight of the patients died. Of forty-nine patients treated conservatively fifteen died. Packing prevents an immediate secondary hæmorrhage but may become loosened. It also interferes with primary healing of the wound. Experiments have been made with resorbable packing material such as fat and fascia, by Kuemmell. Not only a mechanical but also a thrombokinetic effect has been ascribed to this material.

Muscle substance has been applied to arrest hæmorrhage from bone cavities (Schulzen), the cranial bones (Borchardt), sinuses (Stieda), and wounds of the heart (Laewen). In experiments on twenty dogs the author packed nephrotomy wounds with pedunculated and free muscle flaps. The implanted muscle flaps healed into the incisions in the kidney relatively rapidly, even when the renal pelvis was opened. The flap then became necrotic and organized without any signs of regeneration, while sections projecting into the pelvis of the kidney become necrotic throughout.

From the surgical and functional standpoints it was interesting to note that only a few sutures were necessary for complete hæmostasis, the kidney was not injured by the operative procedure or the few loosely knotted sutures, and the functional test of the kidney operated upon was satisfactory. The piece of the transplant which projected into the pelvis of the kidney became necrotic and macerated by the urine and passed off, whereas the muscle substance which had healed in was replaced by connective tissue.

The transplant was taken from the extensor muscles of the back.

The procedure described has not yet been applied to man but it is recommended for aseptic cases in which a medium large incision is made in a well-preserved parenchyma, such, for example, as cases of very small stones in the pelvis of the kidney.

JANSSEN (Z).

Hunner, G. L.: Ureteral Stricture: An Important Etiological Factor in the So-Called Essential Hæmaturias. *J. Am. M. Ass.*, 1922, lxxix, 1731.

Hunner reports his experience with cases of renal hæmaturia of the so-called essential type. He calls attention to the fact that we are indebted for our present knowledge of the subject to the work of Israel. Most writers have followed Israel in ascribing the severe attacks of pain and macroscopic hæmaturia to heightened intrarenal pressure due to rigidity of the capsule, circulatory stasis, or inflammatory congestion, or a combination of these factors. In every instance there is a background of focal, diffuse interstitial, or parenchymatous nephritis.

The object of this article is to call attention to the important rôle that ureteral stricture probably assumes in many of these cases. Hunner refers briefly to his experience with ureteral stricture in

the causation of various nephropathies and states that in eighteen of his cases of essential hæmaturia ureteral stricture was demonstrated.

Israel's main conclusions, ten in number, are stated and briefly commented upon in an endeavor to establish a new point of view as to the etiology of the nephritis in a large proportion of these hitherto imperfectly understood cases.

A careful analysis of Israel's fourteen cases leads Hunner to the conclusion that ureteral stricture was probably present in eleven.

Hunner emphasizes the fact that symptomless renal bleeding is often due to renal tumor. While exploratory operations for the determination of the cause of the hæmorrhage should be less frequent in the future, one should not hesitate to explore a bleeding kidney without delay if a reasonable attempt at diagnosis has failed and the bleeding does not respond to the treatment for idiopathic hæmaturia.

In sixteen cases a good opportunity was offered to study the results of ureteral dilatation in the treatment of the hæmaturia. In two, nephrotomy was done, while fourteen were treated by cystoscopic methods alone and the care of foci of infection such as the teeth and the tonsils. In five cases there was a recurrence of the condition, but in these the presence of residual foci of infection was suggested. In ten cases, including one in which nephrotomy was done, there has been no recurrence. In the later cases no treatment other than wax-bulb dilatation of the stricture was given.

The article is illustrated by numerous pyelograms.

H. A. Fowler, M.D.

Giordano, A. S., and Bumpus, H. C., Jr.: Carcinoma in the Ureteropelvic Juncture Metastatic from the Prostate: Report of a Case. *J. Urol.*, 1922, viii, 445.

Metastasis from carcinoma of the prostate gland is usually detected first in the lumbosacral region. Of a series of 297 cases in which routine roentgenograms were made, eighty-four (28.28 per cent) showed metastasis in the bones. The next most common sites of metastasis are the lymphatics which drain the prostate and the course of the large pelvic blood vessels along which are several groups of lymph nodes. The nodes at the bifurcation of the iliacs are usually the first to become involved. From these, the lymph stream goes directly to a second group located on the sacral promontory and then along the perivertebral nodes. Extension by this route often occurs so rapidly that the supraclavicular lymph nodes are involved before the original malignancy is suspected.

In about 8.47 per cent of the patients in whom metastasis is demonstrable the lymph nodes on the left side of the neck are affected. Enlargement of these lymph nodes suggests that the stomach is the original focus, particularly in the 11 per cent of cases in which malignancy of the prostate does not cause urinary symptoms.

A form of metastasis which occurs only rarely in carcinoma of the prostate is metastatic involvement of the abdominal viscera through the blood stream. In the case reported in this article, metastases were found in the periprostatic and vertebral lymph nodes, and in the left kidney and the ureter close to the renal pelvis. After the application of 1,145 mg.-hrs. of radium, the patient, a man aged 63 years, developed marked gastric, intestinal, and cardiac symptoms, failed rapidly, and died on the sixth day.

At autopsy numerous metastatic nodules were found scattered throughout the pleuræ and lungs. The perivertebral lymph nodes along the lumbosacral region were extensively affected and covered the aorta from the bifurcation to the first lumbar vertebra. The left kidney weighed 130 gm. In its upper pole was an infarct which was found on serial section to be due to metastatic carcinoma cells plugging a small blood vessel. Two grayish nodules discovered at the ureteropelvic juncture were composed of the same type of undifferentiated epithelial cells.

The bladder did not present any gross abnormalities except a rough granular area about 3 cm. in diameter in the base, which was found on section to be a direct carcinomatous infiltration. The prostate gland was moderately enlarged and could not be shelled from its bed. It was firm in consistency and its cut surfaces were gray and granular. The lymph nodes surrounding the prostate were also infiltrated by carcinoma cells. Careful examination did not reveal metastasis to the bone.

The history and the clinical and laboratory findings of this interesting case are given in detail. The authors' conclusions are summarized briefly as follows:

"The metastasis to the pelvis of the kidney in this case may be interpreted as illustrating the direct lymphatic connection to the prostate, bladder, and the kidneys and may be considered evidence that infections of the bladder reach the kidney, not by the lumina of the ureters, but by the lymphatics. However, this does not seem probable, as the lymphatics of the ureters were not involved. Moreover, so far as we know, this is the only case reported in the literature in which carcinoma of the prostate metastasized to the renal pelvis. This extreme rarity should be strong presumptive evidence that direct lymphatic connections between the lower and upper urinary tract do not exist and that infection does not travel in this manner. Otherwise, with the large number of neoplasms of the bladder and prostate, metastasis to the kidney would occur more often.

"In this case the presence of the cancer cells in the blood vessels of the lungs and the metastatic renal infarct would seem to demonstrate that the malignancy was carried through the blood stream to the ureter rather than by the lymphatics, a route probably travelled by many so-called ascending infections."

Edward F. Hess, M.D.

BLADDER, URETHRA, AND PENIS

Young, H. H.: The Operative Cure of Incontinence of Urine, with Illustrative Cases. *J. Urol.*, 1922, viii, 361.

This is a very comprehensive and instructive article discussing in detail the problems presented by the various types of cases, and the operative technique the author has found satisfactory. Case histories are cited and a large number of excellent illustrations are included. Young divides his cases into the following four groups:

Group 1, postoperative incontinence. This includes cases of incontinence due to median urethrotomy and those due to perineal prostatectomy. As a rule there is wide dilation and loss of function of both the internal and the external sphincter. The operations performed for this condition are: (1) suprapubic cystotomy and a plastic operation upon the internal sphincter, and (2) excision of the perineal scar tissue with plastic restoration of the external sphincter. There were three cases in this group.

Group 2, vesicoperineal fistula with incontinence following fracture of the pelvis. This condition the author found in three cases at the Brady Clinic; the pelvis had been badly fractured and the bladder and the urethra ruptured by trauma. In the operation a suprapubic and perineal attack was necessary. The fistulous tract was excised, its internal orifice and the perineal wound were closed, and in one case repair of the external sphincter was indicated.

Group 3, incontinence from perineovesical fistula associated with a dermoid cyst of the prevesical space. This group included one case. The author has been unable to find a similar report in the literature.

Group 4, incontinence of urine associated with epispadias. This form of incontinence is not rare, but very little concerning it has been written. In the three cases seen by the author the urethra was widely dilated and there was absence of musculature in the upper wall, not only in the prostatic urethra but also in the membranous urethra and the triangular ligament.

Urethroscopic and cystoscopic examinations showed marked dilation of both the internal and the external sphincter. The operative problem presented was to excise sufficient tissue to tighten the urethra and restore sphincteric control. A suprapubic incision was first made. When the bladder was opened, a widely dilated prostatic orifice was seen, in the depths of which the verumontanum could be made out. The upper wall of the urethra was thin and fibrous, and the finger could be passed out from the bladder through the dilated prostatic urethra and also through the membranous urethra into the deep bulbous urethra where it was met by a finger passed through the penile defect from without.

It was thought necessary not only to excise the roof of the prostatic urethra, but to continue this excision downward so as to include the roof of the membranous urethra. In doing this it was found helpful to make a part of the excision through the dilated penile defect. After sufficient tissue had been thus removed from the bulbous urethra down to the vesical cavity, approximation of the urethra was effected by means of the boomerang needle holder, first along the roof of the membranous and prostatic urethra through the suprapubic wound and then through the penile defect. When this was completed, the urethra had been tightened at the prostatic orifice so that it resembled a normally closed internal prostatic orifice.

In the first two cases suprapubic drainage was maintained for about three weeks in order to facilitate closure of the sphincteric plastics. The epispadias was corrected at a subsequent operation. The results obtained in the three cases have been satisfactory.

Young draws the conclusion that the three cases of incontinence of urine associated with epispadias and due to a congenital lack of sphincteric musculature along the anterior wall in the region of the internal and external sphincter show that remarkable results can be secured by wide excision, proper approximation of the muscles, and careful placing of the sutures. These cases and those of the three other groups show conclusively that even after extensive destruction of both the internal and the external sphincter, and in the presence of a large amount of scar tissue, it is possible, by thorough plastic operations, to cure incontinence and to obtain normal micturition. EDWARD F. HESS, M.D.

Frangenheim, P.: The Operative Treatment of Incontinence of the Urinary Bladder (Die operative Behandlung der Inkontinenz der Harnblase). *Ztschr. f. urol. Chir.*, 1922, x, 199.

The various surgical methods of treating incontinence of the urinary bladder are discussed and a few of the author's cases are reported. The method used must be suited to the type of case. In the male, the formation of a ring with a strip of fascia from the rectus muscle is almost always employed. In the female the muscle plastics of Stoeckel and Franz are usually indicated but in cases of marked adhesions the pyramidalis plastic is best. In cases of marked prolapse and defective development, the suturing of the cervix into the slit of the pubic portion of the levators (Ruebsamen) or the interposition of the uterus gives the most satisfactory results. The injection of paraffin or humanol has been abandoned because it may be followed by embolism. VONDERBRUEGGE (Z).

GENITAL ORGANS

Schwartz, A. H., and Cancik, J.: Streptothrix Prostatitis. *J. Urol.*, 1922, viii, 451.

Bacteriological study of a series of cases of prostatitis made by the authors revealed the presence of a streptothrix in the prostatic secretion of a large number. This study is summarized as follows:

1. Streptothrix was found by cultural methods in 65 per cent of the cases.

2. Most of the cases with a positive culture of streptothrix differed clinically from the others in that the urethral discharge was distinctly mucopurulent.

3. In eight of the ten cases in which a clinical cure was obtained cultures were negative for streptothrix two weeks after the suspension of all treatment.

4. Ten to 77 per cent of all cases in which the streptothrix was demonstrated were relieved of the urethral discharge by specific vaccine therapy. Supplemental prostatic massage was necessary in only three.

5. Cases responded to autogenous vaccine therapy rapidly or not at all. Of the eight cases in which both a clinical and a bacteriological cure was obtained, seven were given ten injections or less. The eighth case received fifteen injections.

6. Two cases showed a clinical, but not a cultural, cure after fifteen injections.

7. Three cases showed practically no change after twenty or more injections.

EDWARD F. HESS, M.D.

Tenenbaum, J. L.: The Pathology and Mechanism of Prostatic Hypertrophy. *J. Urol.*, 1922, viii, 431.

The author summarizes the various new theories regarding the pathology and mechanism of the changes occurring in prostatic hypertrophy. The subject is discussed under the following headings: (1) the mechanism of the changes in the urethra occurring in prostatic hypertrophy; (2) the effects on the bladder; and (3) the changes in the upper urinary tract and their special mechanism.

The progress made in prostatic pathology leads to the conclusion that the so-called prostatic hypertrophy is really a hyperplasia of the peri-urethral glands. The prostate itself undergoes atrophy through compression by the growth intruding upon it or primarily as a physiological presenile process occurring in advanced life.

Prostatic hypertrophy cannot be considered a disease. The true pathologic process develops with the secondary changes in the urinary tract caused by proliferation of the peri-urethral glands.

The changes in the size, lumen, and curve of the urethra are the result of various co-operating and antagonistic forces, of which the direct pressure of the intruding glands, the indirect influence of the changes in the bladder upon the urethra, and the anatomical peculiarities of the latter are the most important. The part of the urethra which is directly subjected to moulding by the growth is the supramontane portion of the prostatic urethra.

The muscular apparatus of the urethra suffers a gradual loss of elasticity. The most noticeable changes are observed in the so-called "longitudinal muscle" which is subject to direct pressure and distortion by the growth.

Two types of intrusion of the growth into the bladder may be distinguished, viz., the direct and the indirect. Direct invasion occurs on or near the sphincter of the bladder and is associated with alterations in the symmetry of the bladder and the outline of the sphincter. This is not observed in the indirect invasions, which raise the entire floor of the bladder without affecting its symmetry directly.

The pathologic middle lobe formation has nothing in common with the anatomical or Home's prostatic lobe.

The alterations which take place in the bladder are due to two antagonistic forces, the quality and the degree of obstruction and the capacity of the bladder to resist the effects of obstruction. The early stages of bladder involvement are marked by its increased muscular activity. In the later stages of growing disproportion between obstruction and resistance, distention and atony of the bladder are combined with impairment of muscular activity.

The conception of back-pressure as the primary cause of the changes occurring in the upper urinary tract is inconsistent with the anatomical and physiological peculiarities of the bladder and the ureters. Contraction of the bladder prevents rather than causes urinary reflux, and in an atonic bladder urinary reflux is still less probable.

According to Tandler and Zuckerkandl, advanced bladder distention in prostatics favors compression and narrowing of the ureters which in turn may cause obstruction of the downflow of urine and be followed by secondary enlargement of the parts above the stricture.

The early stages of renal involvement occurring in prostatics are marked by congestion of the kidneys associated with nocturnal polyuria and are followed by gradual destruction of the kidney substance with the symptoms of azotæmia and hyposthenuria.

The cystoscopic picture of an enlarged interureteral ligament extending beyond the orifices of the ureters, as observed in the later course of prostatic hypertrophy, is suggestive of a complication in the upper part of the urinary tract.

EDWARD F. HESS, M.D.

Harris, S. H.: Prostatectomy: A Review of a Recent Series of 146 Cases with Five Deaths. *Med. J. Australia*, 1922, ii, 401.

The author reviews a series of 146 cases treated by prostatectomy during a five-year period in which there were five deaths, a mortality rate of slightly less than 3.5 per cent. The deaths were due to embolism, circulatory failure, secondary hæmorrhage, exhaustion, and urosepsis respectively.

Cystoscopy was performed in twenty-seven of the cases, and preliminary cystotomy in thirty. Suprapubic prostatectomy was done in all the cases, Squire's method of enucleation being used. The average age of the patients was 69 years; the oldest was 86 and the youngest 49.

No aperient or enema except ½ pt. of salt solution was administered until the fourth day when 1 oz. of castor oil by mouth and 6 oz. of warm olive oil

by rectum were given. No bladder irrigation of any kind was used during the first fortnight. The majority of the patients begin to pass urine naturally from the eighth to the tenth day. The author urges the use of a glass tube for bladder drainage instead of a rubber tube. T. F. FINEGAN, M.D.

Ward, R. O.: Cysts of the Epididymis. *Lancet*, 1922, ccii, 807.

Cysts of the epididymis are not rare and may reach the size of hydroceles. They are frequently bilateral. Monod and Terrillon divide them into two groups: (1) small cysts lying above the globus major, and (2) larger cysts, so-called spermatoceles, which are more closely related to the testis.

The former, which are unimportant, are not uncommon in old men, and at autopsy are usually found on the convex surface of the globus major. They are sessile and subserous and range in size from that of a pinhead to that of a pea. Their pathogenesis is uncertain. They may arise from vestigial remains and result from trauma or inflammation. They cause no symptoms and require no treatment.

The larger cysts are of clinical importance. Their pathology is still uncertain. They are believed to originate between the under surface of the globus major and the upper surface of the testis, encroaching upon the epididymis. As they show communications with the seminal ducts and contain spermatozoa, they may be due to partial dilatations of the excretory ducts of the testis. They appear to be retention cysts. The usual amount of fluid contained in them is about 5 oz., but much greater quantities have been found.

These swellings are differentiated from hydrocele of the tunica vaginalis by greater softness, palpable loculation, the position of the testis, the presence of spermatozoa in the fluid, the findings of transillumination, and conclusively by tapping.

The palliative treatment is tapping. If recurrence develops, extirpation is indicated.

LOUIS NEUWELT, M.D.

SURGERY OF THE EYE AND EAR

EYE

Brumm, S. A.: The Relation of Orbital Affections Due to Nasal Conditions. *Pennsylvania M. J.*, 1922, xxvi, 74.

Orbital affections due to nasal conditions are favored by deflection of the nasal septum, especially opposite the middle turbinate, abnormality in the size and position of the middle and superior turbinates, and faulty drainage and ventilation. These cause an intrasinusal pressure which produces chronic congestion which is followed by hyperplasia, especially of the basement membrane, and eventually blocks the posterior sinuses. Infection may then take place and cause an inflammatory process. The latter is generally exudative, rarely suppurative.

Swelling infiltration spreads by continuity of the tissues of the optic nerve and its meninges. In many cases there is a history of recent coryza or a prior influenza, and in a few the history of an old intermittent rhinitis with severe headache but without a mucopurulent discharge from the nose. The objective findings are conjunctivitis, choked disk, engorgement of the retina, and loss of the color field. The characteristic symptoms are those of iritis, uveitis, or retinitis.

Local treatment may consist of shrinkage of the turbinates and the use of the vacuum, but the patient should be watched most carefully by the ophthalmologist as operation may become imperative. Surgical treatment may consist in straightening deflections of the septum, turbinectomy, ethmoid exenteration, and sphenoid aëration. For hyperplastic types with infection the author advocates the use of autogenous vaccines. An X-ray examination should be made to determine the presence of anatomical abnormalities.

JAMES P. FITZGERALD, M.D.

Shoemaker, W. T.: Some Observations on Orbital Growths: Reports of Three Cases. *Pennsylvania M. J.*, 1922, xxvi, 70.

A college student aged 21 years had pain for six days in and around the left eye. The lid was slightly swollen, the palpebral fissure a trifle widened, the eyeball proptosed, and the movement of the eyeball limited to the temporal side. The pain was increased when the eyeball was pressed backward. Vision was $^6/_7$ but subsequently decreased to $^6/_{36}$.

Examination of the fundus showed a light blurring of the disk at the temporal side. In the next few days a definite neuritis developed and there was an area of fundus elevation about 5 diopters in excess of the general hyperopia. The overlying choroid and retina were greatly disturbed, and the fundus below was markedly streaked. The elevated fundus was shadowed in transillumination and definitely outlined by perimetry. The left nasal chamber was found congested, but the right was normal. There was no pus in the nose. In transillumination from the mouth both antra were black. In transillumination through the nose, the left antrum was black, but the right was fairly clear. The tentative diagnosis was an unusually thick bone forming the hard palate and possibly a solid growth of the left antrum.

The treatment consisted of mercury inunction to the point of toleration followed by increasing doses of potassium iodide and the administration of arsenic with the mercury. Recovery was rapid, complete, and permanent.

Points emphasized are that cases of unproved malignancy should be given thorough treatment with mercury before they are subjected to surgical interference; that mercury is valuable as an absorbent in many conditions other than syphilis; and that radical measures should not be resorted to before a sufficient amount of time has been allowed for results from other methods.

In an infant 6 months old a hæmangioma originated within the orbit and presented at the inner angle of the base of the upper lid. The physical examination revealed enlargement of the thymus gland, evidences of cretinism, enlargement of the spleen, and other signs of endocrine disturbance. On the skin of the lid, directly over the soft protruding mass, was a small nævus. As the tumor increased in size and was accessible, and as it was unmistakably vascular, operation was decided upon. Ether was administered and the growth extirpated in the usual manner.

Sections of the tumor seemed to confirm the diagnosis of hæmangioma, but there was recurrence within a few weeks and the spleen remained enlarged, suggesting strongly that the second growth was a sarcoma. Opposed to this, however, was the fact that the child's general condition steadily improved.

The recurrent growth, which had extended along the entire base of the upper lid and was larger than the primary growth, was thoroughly removed. The second tumor was variously diagnosed as sarcoma, hæmangio-endothelioma, and hæmangioma.

Since the second operation there has been no recurrence, and the child has remained well.

The use of radium was considered in this case, but Shoemaker regarded it as too powerful and not sufficiently controllable to introduce close to the eyeball.

In the case of a boy 7 years old the surgical removal of a fair-sized encapsulated sarcoma from the orbit was followed by X-ray treatment. Six weeks after the operation active recurrence was noted. The

growth was chiefly on the floor of the orbit, well forward. Four radium tubes were introduced into the tumor and allowed to remain for twelve hours. Within a week practically all signs of swelling had disappeared. During the subsequent four months the skin of the lower lid softened and the proptosis decreased. The process then again became active. There was never any pain. The duration of the condition was fourteen months and the terminal stages lasted about three months.

JAMES P. FITZGERALD, M.D.

Gifford, S. R.: Ocular Sporotrichosis. *Arch. Ophth.*, 1922, li, 540.

Gifford reports the case of a boy 8 years old who had a persistent fistula of the lachrymal sac connected with infected ethmoid cells. Cultures of scrapings showed sporotricha, and these organisms were isolated in pure culture from an inoculated white rat. The patient was given large doses of iodides. The end-result is not reported but the statement is made that the lesion healed.

The author reviews a number of similar cases which have been reported in the literature.

THOMAS D. ALLEN, M.D.

Neame, H.: Ocular Sarcoma with Wide Extension Involving the Brain and Spinal Cord. *Brit. J. Ophth.*, 1922, vi, 493, 537.

Penetration of the globe by epibulbar sarcoma is rare, and instances in which this occurs without causing extensive damage to the form of the eyeball are particularly unusual. A case of the latter type is reported in this article with a general review of the literature of the subject.

The author's patient was a man 53 years of age who complained in 1919 of slight irritation beneath the upper lid of the left eye. Though the lump increased in size steadily, no disturbance of vision was noted for six months. By March, 1921, there was marked swelling of the subconjunctival tissue with overlapping of the corneal margin all round, suggesting proptosis. The conjunctiva covering the swelling was adherent, tense, and glistening, and contained many blood vessels running toward the cornea. The growth itself was firm throughout. The cornea was hazy, and a small brownish-red patch which was dimly visible in the lower part of the anterior chamber was taken to be a hyphæmia. No details of the iris or lens were visible.

Enucleation was performed. Examination of the globe revealed a disseminated sarcomatous structure invading practically all of the intra-ocular tissues. Three months later it became necessary to exenterate the orbit because of a recurrent growth, but healing was prompt and at the end of another six months there had been no reoccurrence.

The author draws the following conclusions as to the treatment:

1. If the growth is freely movable with the conjunctiva over the underlying structures and increases in size slowly, local removal is indicated.

2. If the growth is the least adherent, the globe and a considerable margin of conjunctiva should be removed and radium applied.

3. If the growth is large and there is a history of rapid extension, the orbit should be exenterated.

JAMES P. FITZGERALD, M.D.

Woods, A. C., and Knapp, A.: The Therapeutic Use of Uveal Pigment in Sympathetic Ophthalmia. *Arch. Ophth.*, 1922, li, 560.

The authors report the case of an 8-year-old boy who had an unhealed corneal ulcer and prolapse of the iris, the result of a gonorrhœal conjunctivitis of three months' duration. Vision was light perception and tension plus. An iridectomy was done, the defect in the cornea curetted, the prolapsed iris removed, and the corneal wound covered with a conjunctival flap. Six weeks later the patient returned with a sympathetic irritation. A week later this had increased to an inflammation. The injured eye was then removed.

The patient's serum reaction to uveal pigment was negative, showing no immunity whatever. A subconjunctival injection of cyanide of mercury, the administration of pilocarpine to induce sweating, and mercurial inunctions had no effect upon the condition. A course of non-specific protein therapy was then begun, but as the eye continued to grow worse the treatment was changed to doses of sodium salicylate. These also were without effect.

Two months after the beginning of the sympathetic inflammation, the injection of uveal pigment was begun. Gradually the eye became better, and although there was a short exacerbation one month later, the general tendency was toward improvement, the eye finally becoming white and free from inflammation and with final vision 20/200.

The technique of administering the pigment is described in detail.

THOMAS D. ALLEN, M.D.

Jack, C. M.: Focal Infection in the Tonsil Causing a Tuberculous Ophthalmia. *J. Am. M. Ass.*, 1922, lxxix, 1576.

The author reports the case of girl aged 21 years whose condition was diagnosed as tuberculous sclerokeratitis, a diagnosis confirmed by several oculists.

The physical and roentgen-ray examinations were negative although the patient was operated on at the age of 3 years for cervical adenitis and at the age of 14 had a tonsillectomy for repeated attacks of tonsillitis and several other operations for the removal of remnants of tonsillar tissue. Vision had become so poor that she was unable to recognize another person in the same room.

Jack enucleated the tonsil stumps, believing them to be the focus of infection. Upon pathologic examination they showed chronic inflammation, hyperkeratosis, and great numbers of miliary tubercles clustered around the crypts. The majority of the latter were epithelioid tubercles, but those which were larger and confluent showed caseation and giant cells.

Following the operation, vision in the right eye improved to 20/50 and that in the left became normal.

The author has been unable to find the report of a similar case in the literature.

JAMES P. FITZGERALD, M.D.

Verhoeff, F. H., and Friedenwald, J. S.: Injury to the Cornea and Conjunctiva Due to Fish Bile. *Am. J. Ophth.*, 1922, v, 857.

As a result of experimental testings of the effect of bile on rabbits it was thought that the corneal opacity originally attributed to fish bile in the case reported was probably due to the use of lead acetate as an eye wash. Verhoeff and Friedenwald therefore warn ophthalmologists against the use of lead acetate in corneal abrasions.

THOMAS D. ALLEN, M.D.

Johnson, G. L.: A New Method of Removing the Lens in Its Capsule. *Arch. Ophth.*, 1922, li, 548.

The author uses two instruments, a shovel spoon and an extraction spoon, which are shown in cuts. He inserts one spoon close to the pupillary edge at the top and while making pressure with the other spoon on the lower part of the cornea, breaks the zonular fibers above and presses the lens out onto the first spoon. He is not concerned by the loss of a small amount of vitreous provided he does not uncover the ora serrata. THOMAS D. ALLEN, M.D.

Blake, E. M.: Bilateral Detachment of the Retina in Nephritis of Pregnancy; Reattachment of Retinæ. *Arch. Ophth.*, 1922, li, 586.

In the case reported final vision was 20/50 in the right eye and 20/100 plus in the left, and the visual fields were practically normal.

Blake reviews the literature briefly and concludes that ophthalmologic examinations should be made more frequently in cases of pregnancy.

THOMAS D. ALLEN, M.D.

EAR

Hodges, P. C.: A New Method of Simultaneous Stereoscopic Observation of Both Mastoids. *Am. J. Roentgenol.*, 1922, n.s. ix, 753

The author makes stereoscopic exposures of both mastoids on 5- by 7-in. films and then mounts these on two pieces of 10- by 7-in. celluloid in such a manner that those of one side may be seen stereoscopically above those of the other side. He has found his method simpler than that described by Hill and Thomas in 1911 and equally efficient.

ADOLPH HARTUNG, M.D.

Gottlieb, M. J.: The Indications for the Radical Mastoid Operation. *Am. J. Surg.*, 1922, xxxvi, 266.

A foul aural discharge, exposed bone in the middle ear, and a decided decrease in hearing, singly or altogether, do not constitute a definite indication for the radical mastoid operation.

A chronic fœtid aural discharge accompanied by headache or vertigo originating in the ear indicates the operation, even though hearing is good.

The presence of large obstructing polypi, cholesteatomata, or fistulous tracts draining through the mastoid cortex or the posterior bony wall of the external auditory canal constitute a definite indication for operative intervention.

An acute exacerbation of obstruction to drainage in a case of chronic mastoiditis warrants radical treatment.

The development of facial paralysis as a complication of chronic otorrhœa is a definite indication for the radical mastoid operation.

Cases illustrating the occurrence of fistulous tracts and signs of obstruction to drainage in the middle ear are presented in detail.

The radical operation should never be done unless a functional test of the labyrinth has ruled out the presence of a latent chronic labyrinthitis.

MAURICE H. COTTLE, M.D.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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INTERNATIONAL ABSTRACT OF SURGERY

APRIL, 1923

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Burket, W. C., and McClure, W. B.: An Aseptic Method of Intestinal Anastomosis; An Experimental Study. *Surg., Gynec. & Obst.*, 1922, xxxv, 816.

In the method described, the authors use an instrument formed of male and female halves. A protected cylindrical knife blade contained in the male half of the instrument cuts against the female half which consists of a solid block. The aseptic operation is performed as follows:

The intestine is resected between ligatures with the actual cautery, and after the mesenteric vessels in the operative field have been cared for, each cauterized gut end is invaginated with half the instrument to such an extent that a double pursestring suture may be tied down over the outer end of the half of the instrument. The halves of the instrument are then brought together and the abutted ends of the intestine anastomosed with interrupted mattress sutures. The mesentery is closed with a continuous glove suture. When the gut ends have been completely sutured, the lumen is re-established by cutting out the intervening gut-wall diaphragms by gently manipulating the cylindrical knife blade through the intestinal wall. The anastomosis is completed by sliding the instrument down the intestine well away from the site of the operation. It will then be passed out of the intestines by peristaltic movement.

This method has been employed frequently on freshly isolated pig's intestine and also in aseptic operations on living dogs under ether anæsthesia. Its advantages are summarized as follows:

1. The closed abutted ends of the gut are cut through and the lumen is promptly re-established without soiling of the operative field or the withdrawal of any material or instrumental device through the line of suture.

2. No mechanical device is left *in situ* to interfere with the healing, as in the use of the Murphy button. The cylindrical knife is removed from the field before the operation is completed.



Diagrammatic longitudinal section. Instrument in vaginated into gut ends and parts brought together for intestinal suture and manipulation of the cylindrical blade to cut out the intervening diaphragms of gut wall.

3. The remaining inturned cuff of intestinal wall is a desirable length, and is neatly, sharply, and uniformly cut.

4. An anastomotic opening is obtained which in diameter closely approximates the gut lumen and prevents temporary obstruction or too great narrowing of the lumen.

5. Soiling is reduced to the minimum, dependent upon the effectiveness of the cautery and the skill with which sutures are placed in the submucosa without penetrating the mucosa.

WALTER C. BURKET, M.D.

ANÆSTHESIA

Meeker, W. R., and Frazer, E. B.: Transsacral Nerve-Block Anæsthesia in Surgery of the Pelvic Floor and Its Viscera. *Surg., Gynec. & Obst.*, 1922, xxxv, 801.

Block of the sacral nerves may be accomplished by four different methods: (1) epidural, sacral, extradural, and caudal anæsthesia induced by the

injection of anæsthetic solutions into the sacral canal by way of the sacral hiatus, (2) block of the nerve trunks after the plexus has been formed, (3) parasacral, presacral, and anterior sacral anæsthesia or block of the nerves at their exits from the anterior sacral foramina, and (4) transsacral anæsthesia, or block by means of injections through the posterior sacral foramina.

In the first method 30 c.cm. of a 2 per cent solution of novocaine in bicarbonate solution are injected into the sacral canal. Anæsthesia usually results within twenty or thirty minutes; its upper limit is variable but as a rule it includes the entire pelvic floor and viscera. This method fails to give operative anæsthesia in 10 to 15 per cent of cases and is followed by toxic symptoms more frequently than other methods.

Block of the pudic nerve posterior to the spine of the ischium and on the mesial surface of the inferior ramus of the ischium has been advocated. The methods are technically difficult and do not give extensive operative anæsthesia of the pelvic floor, even though both pudic nerves are properly blocked.

The presacral, or parasacral, method is also technically difficult, its results being consequently undependable. It is usually combined with local infiltration of the tissues. It fails to cause complete operative anæsthesia in about 10 per cent of cases.

For these reasons the transsacral method has been employed for the upper four sacral nerves, with a low epidural injection for the fifth sacral and anococcygeal fibers. Complete operative anæsthesia resulted in 222 of 225 consecutive cases. In the three cases in which the anæsthesia was not complete, it was sufficient for the completion of the operation without additional infiltration of the operative field or inhalation narcosis. The series included twenty-one patients who had a "cold" on the morning of the operation, forty-one who were in the hospital convalescing from a previous operation, thirty-two for whom local anæsthesia was advised because of poor general condition, two diabetics who were sugar free at the time of operation, five patients with marked anæmia who had had previous transfusions, five patients with clinical pulmonary tuberculosis, in two of whom the condition was active at time of operation, and six obese women each weighing over 200 lb.

Complications and after-effects have been few and of no serious concern. The variety of operations performed by this method demonstrates that with block of the sacral nerves the entire pelvic floor is anæsthetized with the viscera lying below the pelvic peritoneum. The more dependent part of the peritoneum is also anæsthetized so that it may be opened and closed, but any considerable pull may be transmitted outside of the anæsthetized field and cause pain.

SURGERY OF THE HEAD AND NECK

HEAD

Murphy, J. B., and Sturm, E.: Homoplastic and Heteroplastic Tumor Grafts in the Brain. *J. Am. M. Ass.*, 1922, lxxix, 2150.

Shirai of Tokyo reported that heteroplastic tumors grow readily when inoculated into the brains of normal adult animals. Previously, tissue had been transplanted to a different species only in the embryo and in adult animals which had been exposed to the roentgen rays.

The lymphoid cells are considered to form a defensive mechanism against tissue grafts because:

1. Numerous lymphocytes occur about a heteroplastic graft.

2. Foreign tissues growing in the chick embryo cause no cellular reaction until after the eighteenth day of incubation, when the graft starts to disappear rapidly and completely.

3. A graft of adult chicken spleen renders the embryo resistant to heteroplastic tissues during the early stages of incubation.

4. Adult animals deprived of the major portion of lymphoid tissue are deprived of their ability to destroy the foreign tissues; in such animals grafts will grow actively.

5. Foreign tumors may be carried through several generations in irradiated animals.

The author inoculated a transplantable mouse sarcoma into the brains of rats. When the graft came in contact with the ventricle there was a reaction which suggested the reaction caused by a foreign graft in the subcutaneous tissues and was followed by necrosis of the graft. Of the grafts embedded in the frontal lobe at a distance from the ventricle, from 80 to 100 per cent grew in without causing a cellular reaction.

Mouse sarcoma was successfully grown in the brains of rats, guinea-pigs, and pigeons. A mouse carcinoma used as a heteroplastic graft grew less rapidly.

A bit of the animal's own spleen inoculated into the brain with the heteroplastic tumor tissue prevented the growth of foreign cells. Of fifty rats inoculated with spleen and tumor, 84 per cent showed complete inhibition of tumor growth. In 16 per cent only a few of the tumor cells were left. Of forty-eight control rats inoculated with sarcoma alone, 83 per cent developed tumors, some of which replaced almost the entire frontal lobe. Splenic tissue derived from another animal failed to inhibit the growth of the tumor.

Mice highly resistant to subcutaneous homoplastic transplants of mouse tumor gave no evidence of this resistance when the tumor was inoculated into the brain.

WALTER C. BURKET, M.D.

Federspiel, M. N.: Harelip and Cleft Palate. *Laryngoscope*, 1922, xxxii, 950.

The repair of harelip should be done as soon after birth as possible. In most cases it is done at the end of the third or fourth week.

Proper pre-operative care is essential. The infant should not be allowed to nurse until the borders of the lip are brought together as much as possible and held by a strip of adhesive. The adhesive tape properly placed prevents the orbicularis oris muscle from pulling the lip from the midline and increasing the deformity.

In the operation for single harelip the lip must be freed from its attachment to the maxilla. The borders should be so cut that symmetry of the nostrils is readily obtained with an invisible scar and a vermillion border with a good contour.

The sutures should be so placed that the raw surfaces will be in contact without any curling or buckling of the edges. In order to prevent tension, adhesive is fastened to the cheek on each side. The edges near the lip are turned inward. A strong paraffin silk ligature is then passed through the tape into the lip, midway between the skin and mucous membrane, in the form of a mattress suture. By tying the loose ends, sufficient tension can be brought to bear so that the approximating sutures will not be torn out by the sphincter-like action of the orbicularis muscle.

Great care is necessary in operating upon a cleft palate. In some instances mechanical appliances are more efficient than surgical correction if the cleft is wide.

JAMES C. BRASWELL, M.D.

Simmons, C. C., and Daland, E. M.: The Results of Operations for Cancer of the Lip at the Massachusetts General Hospital from 1909 to 1919. *Surg., Gynec. & Obst.*, 1922, xxxv, 766.

In reviewing the results of operations for cancer of the lip during a ten-year period at the Massachusetts General Hospital the authors failed to find any new facts in regard to the etiology of the condition.

The total number of cases available for study was 187. The end-result was learned in 138.

Specimens from 103 cases in which the end-result is known were also available for study. An attempt was made to classify them into groups according to the degree of malignancy as indicated by the differentiation of the cells and the number of mitotic figures. It appeared from the results in these groups that, other things being equal, such as the duration and extent of the growth, the amount of differentiation of the cell has a distinct bearing on the prognosis, the prognosis being better the greater the differentiation.

The presence of palpable glands did not necessarily mean that metastases had occurred, as in many cases in which the presence of glands was noted in the history pathologic examination failed to show cancer. The presence of demonstrable metastatic cancer in the glands was a grave sign.

The first sign was described as a "sore" or "cold sore" in eighty-three cases, a "scab" in nineteen, a "wart" or "tumor" in thirty-eight, and a crack, blister, cut, or pimple in the remainder. The presence of palpable glands had little relation to the size or duration of the tumor except in the obviously far advanced cases. The growth was situated on the left side in fifty-seven cases.

The radical operation was performed in 122 cases. In seventy-three, the glands were removed from one side of the neck, and in forty-nine, from both sides. The palliative operation was performed in forty-one cases, the growth being removed from the lip without dissection of the glands of the neck.

In the 122 cases of radical operation there were three postoperative deaths. There was no operative mortality following the palliative operation.

With one exception, the postoperative complications were due to some form of infection.

Secondary operations for local recurrence of the disease were performed twice; both of the patients are well three or more years after the operation.

In seven cases in which the neck had been previously dissected, a second extensive dissection was performed for recurrence. All of these patients are dead; two died as a result of the operation, and five of the disease.

The end-results of the radical operation in ninety-eight cases are known; sixty-eight patients are living and well without evidence of the disease more than three years after the operation, twenty-seven died from a recurrence of the disease, and three died as the result of the operation. The cures following the radical operation therefore equaled 68.1 per cent.

The relation of the size of the growth on the lip to the prognosis is shown by the small percentage of cures in the cases requiring a plastic operation to close the defect after the excision of the growth. Of fourteen patients traced, only four are living and well.

Of nineteen patients traced who had involvement of the glands, only five are well, while of seventy-two without gland involvement sixty-three are well.

In many of the cases the site of recurrence could not be determined. In the only patient dying of recurrence on whom an autopsy was performed there was local recurrence only.

The palliative operation was performed in forty-one cases. In most of these the radical operation was contra-indicated on account of the patient's physical condition or age. The results are known in thirty-five cases of this group. In twenty, a three-year cure was obtained.

The average length of life of all patients dying of recurrence was approximately two years from the date of operation. When the glands removed at operation showed cancer, the length of life was slightly shorter than the average. With one exception in the cases of patients dying of the disease, the recurrence developed or death occurred within the three-year limit. One patient died of glandular recurrence seven years after the primary operation.

JAMES C BRASWELL, M.D.

NECK

Pfahler, G. E.: Radiotherapy in Carcinoma of the Larynx, with Special Reference to Radium Needles Through the Thyroid Membrane. *J. Radiol.*, 1922, iii, 511

The most recent method of treating carcinoma of the larynx consists in the direct application of several 3-mm. tubes of radium following a preliminary tracheotomy.

Radium may be applied to a carcinoma of the larynx directly by four methods: (1) the insertion of emanation seeds into the diseased tissue by direct laryngoscopy, (2) the introduction of radium needles attached to a strong thread, (3) the application of radium under direct vision through a laryngotomy incision, and (4) the insertion of radium needles through the thyrohyoid membrane.

A disadvantage of the first method is that the emanation seeds may be inhaled, an occurrence leading to abscess of the lung. The second method is contra-indicated if the tissues are friable because under such conditions it is extremely difficult to keep the needles in place. The insertion of needles into the diseased tissue through the thyrohyoid membrane was first tried by the author on cadavers and then used in twenty cases reported in this article.

External radiation with the roentgen ray was given to devitalize the primary cancer cells and metastatic lymph nodes, and the radium was introduced about a week after the preliminary tracheotomy. The needles were sterilized by suspending them in boiling water and were then attached to sterile copper ligature wire. The author states that iodine should not be employed in sterilizing the skin as it causes a dermatitis. Ten milligram needles can be inserted approximately 1 cm. apart and left in place four to six hours. Considerable œdema will result, but this will be taken care of by the preliminary tracheotomy. If the disease has not completely disappeared at the end of six weeks the procedure may be repeated.

The treatment advocated retarded the progress of the condition in the author's cases, but sixteen of the twenty-three patients ultimately died of the disease. The author draws the following conclusions:

1. A preliminary tracheotomy is desirable.
2. The roentgen ray applied externally gives at least partial relief of the symptoms.
3. The insertion of radium needles into the diseased tissue through the thyrohyoid membrane is practical and its results justify further trial of the method.
4. As the condition tends to recur, the patient should be kept under close observation for a long time.

PAUL W. SWEET, M.D.

Klose, H., and Hellwig, A.: Malignant Struma [Die Struma maligna] *Klin. Wchnschr.*, 1922, i, 1787

In the vicinity of Frankfort about 3 to 4 per cent of nodular goiters become malignant. Carcinoma occurs most frequently in districts where goiter is endemic. A nodular goiter always precedes the cancer, and injuries to the tissues may favor the cancerous degeneration. Females are more often affected than males; of twenty patients, seventeen were women. The condition occurs most frequently in the fifth decade of life. Most malignant growths developing in goiter are carcinomata. The metastases occur chiefly in the lungs and the bones, particularly the spine, sternum, pelvis, and ribs. The development of the cancer is recognized by an accelerated growth of the goiter, an increase in its consistency, and a decrease in its movability, difficulty in swallowing, and, in the later stages, circulatory disturbances. In the Maingau district the development of the symptoms of exophthalmic goiter is an important early symptom of malignant growth. Occasionally high temperatures are observed. Cancerous cachexia is rare.

Exploratory puncture is contra-indicated. Laryngoscopy should be done only by experienced physicians. Biopsy is justified only when the radical operation can be performed immediately afterward if malignancy is found. The average duration of malignant goiter is about two years. The treatment should be total extirpation of the thyroid gland with postoperative roentgen irradiation. In cases of progressively infiltrating growths roentgen irradiation alone, in accurate dosage, is preferable to surgical treatment.

KLOSE (Z).

Roeder, C. A.: Thyroidectomy: A Modified Technique. *J. Am. M. Ass.*, 1922, lxxix, 2066.

Following resection of the thyroid we too often see: (1) a brawny induration beneath the flap, (2) a tender nodule where the depressor muscles were sutured, (3) an annoying adhesion between the trachea and skin at the point of drainage, which also causes widening of the scar, or (4) an abnormal deepening of the suprasternal notch due to a loss of the isthmus and retraction of the skin by the adherent trachea.

The author presents modifications in technique designed to overcome these sequelæ. In goiters of medium size he extends his incision through the deep cervical fascia, reflecting the latter as the lower layer of the flap. This permits sufficient retraction of the sternohyoid muscles to give the desired exposure without cross-sectioning. The collar incision of Kocher as originally described and generally practiced today extends only to the deep fascia, leaves the sternohyoid and sternothyroid muscles immobilized, and is most applicable to large goiters in which transverse division of the sternohyoid and sternothyroid muscles is necessary and to small goiters for which only moderate exposure is required.

Adhesion of the platysma to the deep fascia is followed much oftener by a brawny induration than is adhesion of the fascia to the deeper muscles. In order to prevent adhesion of the skin to the trachea the author passes a rubber-tube drain through a stab wound in the ribbon muscles and brings it out through the line of incision lateral to the supra-

sternal notch. This permits closure of the ribbon muscles over the trachea and suture of the skin in the midline where it is thinnest and the platysma is absent.

For ligation of the inferior thyroid artery Roeder makes a 2-in. incision in the line of the full collar incision to be made later. If the patient withstands the operation better than anticipated, slight extension of this incision will permit resection of the lobe. Reflection of the deep fascia with longitudinal splitting of the ribbon muscles gives ample exposure.

S. J. Seeger, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Bull, P.: Extrapleural Thoracoplasty in the Treatment of Pulmonary Tuberculosis. *Brit. M. J.*, 1922, ii, 1217.

On the basis of seventy-five cases of extrapleural thoracoplasty Bull comes to the following conclusions:

In unilateral or mainly unilateral pulmonary tuberculosis which is not cured by rational expectant treatment or by artificial pneumothorax, good results can be obtained by means of extrapleural thoracoplasty.

On the whole, it may be said that the indications for extrapleural thoracoplasty coincide very closely with those for artificial pneumothorax and the former should be tried when the latter cannot be used. Care must be taken in determining the condition of the other lung. Tuberculosis of the larynx or of one kidney does not constitute a contra-indication. Tuberculosis of the larynx will often heal after a successful thoracoplasty. This operation is best performed in two stages.

Bull has done most of his work with the aid of local anæsthesia but is becoming more inclined to the use of general anæsthesia. In the first stage of the operation he resects from the eleventh to the sixth or fifth rib. In the second stage, two or three weeks later, he resects the remaining upper ribs. After the fourth rib has been resected he performs apicolysis which, in addition to collapsing cavities in the apex, facilitates the resection of the upper ribs.

Fat implantation after the method of Tuffier is done to compress the apex still further. Seven centimeters of the eleventh rib, 12 cm. of the tenth and ninth ribs, 15 cm. of the following, ribs including the fourth, and as much as possible of the upper ribs are resected. It is important to resect backward far beyond the costal angle up to the costal tubercle.

One of the chief unpleasant sequelæ is dyspnœa. This is due to a great extent to mediastinal flutter and soon disappears spontaneously.

The operation is followed by scoliosis with the convexity toward the side operated upon, due to paralysis of the long muscles of the back on this side.

The immediate mortality in the author's series of cases was 10 per cent. A three-year cure was obtained in about one in three.

Ralph B. Bettman, M.D.

Rud, H.: Fibro-Adenoma of the Breast in the Male (Ueber Fibroadenom der Mamma bei Maennern). *Hosp.-Tid.*, 1922, lxv, 253.

Carcinoma of the male breast is not rare. Benign tumors are less common. According to Williams' statistics regarding 15,481 neoplasms, 2,422 (15 per cent) involved the breast, and of the latter, twenty-five (1 per cent) involved the male breast and only six were benign.

Among malignant tumors, carcinoma stands first; the benign tumors of the male breast are fibro-adenoma, fibroma, adenoma, lipoma, atheroma, myoma, tuberculoma, syphiloma, and cystic tumors. Myxoma, angioma, enchondroma, and mixed tumors are very rare.

Five cases of fibro-adenoma of the male breast observed by the author are reported. All of them occurred in men between the ages of 18 and 22 years. They ranged in size from that of a hazelnut to that of a mandarin. In no case was the nipple retracted. Malignant change is possible; in some circumstances it is not easy to make a decision regarding the presence or absence of malignancy from the histologic picture. In the author's opinion sharp demarcation of the tumor indicates a benign growth only in the female. In the male, diffusely growing fibro-adenomata are found.

In the differential diagnosis gynecomastia and mastitis pubescentium virilis can be easily excluded. In four of the five cases reported, trauma preceded the tumor by from three weeks to eight months. Tumor frequently develops from chronic mastitis. While symptoms of mastitis are present the treatment should be conservative; later the tumor should be excised. If the tumor is of diffuse growth, amputation of the breast with removal of the axillary glands is indicated. If the tumor is circumscribed, extirpation usually suffices. Peiper (Z).

TRACHEA AND LUNGS

Balboni, G. M.: Hydatid Cyst of the Lung. *Boston M. & S. J.*, 1922, clxxxvii, 870.

Echinococcus cyst of the lung is one of the conditions to be ruled out in cases of pulmonary disease with bloody sputum or frank hæmoptysis, especially among the immigrant classes from continental Europe and Asia Minor. Of late years the number of cases of echinococcus cyst of the lung which have come to light has increased because of the more extensive use of the X-ray in the study of chest conditions. The disease is usually unilateral. In

most cases it is on the right side and at the periphery of the middle portion of the lung.

Hydatid cysts of the lung may be closed or open. The open cyst is one that has ruptured into a bronchus or lung tissue. Expulsion of part or all of the contents of the cyst may occur. Membrane vesicles and scolices have been found in the expectorated material. The contents of the cyst may be clear or purulent fluid. A common sign is bloody sputum or hæmorrhage.

The course of the disease is chronic. Spontaneous cure is very rare. The symptoms may simulate those of almost any pulmonary infection. Not until the cyst ruptures or the lung becomes inflamed will the patient become conscious of any trouble. Eosinophilia is rarely present. The complement-fixation test, when positive, is confirmatory, but when negative does not rule out the condition. Exploratory puncture of the cyst is inadvisable because of the serious sequelæ which may follow its rupture.

The author reports two cases. The second was treated with the X-ray but there was no improvement or change in the X-ray signs. Whenever possible, the disease should be treated surgically.

RALPH B. BUTTMAN, M.D.

Hedinger, E.: Fatal Congestive Hæmorrhages in the Lung and the Central Nervous System Due to Momentary Bodily Exertion and Their Relationship to Perthes' Pressure Congestion (Ueber tödliche Stauungsblutungen in den Lungen und im Zentralnervensystem bei momentaner starker körperlicher Anstrengung und ihre Beziehung zur Perthes' schen Druckstauung). *Schweiz. med. Wchnschr.*, 1922, lii, 833.

A case is reported in which apoplexy of the lung with hæmorrhages in the brain and spinal cord was caused by momentary overexertion. The clinical course and the autopsy findings indicated hæmorrhage due to active congestion in contrast to the hæmorrhage of Perthes which is due to passive congestion caused by compression of the trunk.

DESSECKER (Z).

HEART AND VASCULAR SYSTEM

Pleth, V.: Cervical Sympathectomy as a Means of Stopping the Pain of Angina Pectoris. *Am. J. Surg.*, 1922, xxxvi, 100.

Jonnesco removes the left cervical sympathetic nerve and its ganglia to relieve the pain of angina pectoris. In the four cases in which the author performed this operation the pain ceased immediately. Pleth has used the same treatment also in cases of trifacial neuralgia and has seen no ill effects attributable to it, provided a preliminary hypodermic injection of atropine sulphate was given about half an hour before the operation and traction on the vagus was avoided. In several cases of bilateral facial neuralgia he operated on both sides of the neck.

The temporary application of a Crile clamp to the common or the external carotid artery greatly facilitates the operation by keeping the field bloodless.

Pleth concludes that the cutting of the sympathetic nerve causes a vasoparalysis with subsequent vasodilation which permanently floods the painful anæmic parts with blood.

The operation is not regarded as a cure for the underlying disease causing the angina pectoris, being recommended merely to relieve the pain. The suppression of the paroxysms of pain does away with the usual cause of sudden death in cases of aortitis as it affects mainly the origin of the vasa where the network of nerves is especially close and the pain is exceptionally severe.

WALTER C. BURKET, M.D.

PHARYNX AND ŒSOPHAGUS

Steiner, O.: Multiple Cancer Formation: Carcinoma of the Vallecula Epiglottica and of the Œsophagus (Zur Kenntnis mehrfacher Krebsbildung: Carcinom der Vallecula epiglottica und des Œsophagus). *Med. Klin.*, 1922, xviii, 1249.

The author reports two cases of carcinomatous involvement of the pharynx (vallecula) and the œsophagus in which the two tumors were separated by a wide stretch of healthy tissue.

CASE 1. A tumor of the vallecula the size of half a nut was shown by biopsy to be a cancroid. After ligation of the lingual artery the growth and glands were extirpated under conduction anæsthesia by splitting the cheek and reflecting the lower jaw upward. Death occurred on the sixth day from pneumonia. Autopsy revealed a cancroid of a similar histologic structure in the lower third of the œsophagus. Except for an occasional sticking pain over the lower portion of the sternum, there were no signs of an œsophageal tumor during life.

CASE 2. A carcinoma of the œsophagus was diagnosed by the use of a bougie, the X-ray, and œsophagoscopy. At the same time a tumor of the vallecula was found by laryngoscopy. Biopsy showed that the tumors were cancroids of similar histologic structure. Clinically, there were no symptoms attributable to the tumor of the vallecula, the condition being discovered only on laryngoscopic examination.

Only one case of multiple primary carcinoma of the pharynx (tongue) and the œsophagus is reported in the literature. Metastatic formations do not occur very often in carcinoma of the œsophagus as compared with carcinomata of other parts. True metastasis in the œsophagus or the pharynx with carcinoma of other organs has not been described. Secondary involvement of the œsophagus or the pharynx by the spreading of carcinoma from one to the other is more frequent. Primary carcinoma of the pharynx is not very rare. Inoculation metastases from aspiration have been reported.

The relationship to each other of the carcinomata of the œsophagus and the pharynx in the cases observed cannot be determined. It is probable, however, that in both cases the carcinoma of the

œsophagus was the primary lesion and the carcinoma of the pharynx a metastasis.

Radical operation for a carcinoma at the base of the tongue or of the pharynx should be done only after it has been determined by careful examination (sounding, roentgenography, and particularly œsophagoscopy) that the œsophagus is not affected by carcinoma. SOMMAG (Z).

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Moschcowitz, A. V.: The Anatomy and Identity of "Encysted" and "Infantile" Hernia. *Surg., Gynec. & Obst.*, 1922, xxxv, 711.

Hey first described "infantile hernia" several years before Cooper's first account of "encysted hernia." The author regards the nomenclature as archaic.

All abnormalities of the hernial sac can be traced to faulty closure of the processus vaginalis. In its descent into the scrotum the testis is accompanied by the processus vaginalis peritonei. After the complete descent of the testis the vaginal process becomes shut off at the abdominal end and just above the testis, while the intervening portion becomes obliterated to a fine cord-like structure within the confines of the spermatic cord, and the distal part persists as the tunica vaginalis testis.

The closure of the vaginal process does not follow any set rule.

In congenital inguinal hernia the processus vaginalis has failed to close at both the testicular and the abdominal ends and forms a sac into which some unusual effort will force abdominal contents and thus form a complete scrotal hernia. The author believes that "hernia into the vaginal process" would be a better name for this condition. This hernia is characterized chiefly by the presence of the testicle within the hernial sac and by the exceeding thinness of the sac.

In hernia into the funicular process the vaginal process has become shut off at its testicular end but not above this point. The tunica vaginalis testis is normal. When abdominal contents pass through the open abdominal end of the vaginal process, a hernia results. This form should be called "hernia into the supratunical vaginal process." It is characterized by a very thin sac and the absence of the slender cord of the obliterated vaginal process.

In encysted hernia, the vaginal process has become shut off at the abdominal or proximal end but not elsewhere. If a hernia forms, it descends in front of the cord and vaginal process. If the vaginal process contains an exudate and a hernia forms, the sac bulges into the closed-off vaginal process and produces the so-called "encysted hernia." At operation the surgeon may open the vaginal process by mistake for the sac and will be surprised to find no communication with the general peritoneal cavity. The true sac protrudes on the posterior wall of the sac of the vaginal process. This form is differentiated from simple inguinal hernia associated with ordinary hydrocele of the tunica vaginalis testis by the ease or difficulty with which the hernial sac can be separated from the hydrocele sac. In "encysted hernia" they are densely adherent to one another and cannot be separated.

In "infantile hernia" the maldevelopment is practically identical with that of "encysted hernia" but instead of becoming invaginated in the pre-



Fig. 1. Congenital hernia.

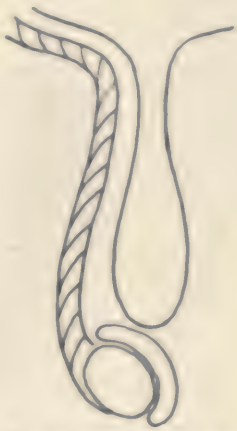


Fig. 2. Hernia into the funicular process.



Fig. 3. Encysted hernia.

formed sac, the hernial protrusion descends behind the sac. In the author's opinion there is no material difference between these two forms of hernia.

WALTER C. BURKET, M.D.

Capps, J. A., and Coleman, G. H.: Experimental Observations on the Localization of the Pain Sense in the Parietal and Diaphragmatic Peritoneum. *Arch. Int. Med.*, 1922, xxx, 778.

The authors' knowledge of sensation in the abdomen and its viscera is based largely on the careful and ingenious observations of other investigators. It is agreed that the hollow viscera and omentum give no sensation response to heat or cold, to cutting, or to clamping.

One investigator found that the parietal peritoneum is sensitive to irritation, especially when inflammation is present, and from his experiments concluded that all visceral pain is the result of inflammation and traction on the parietal peritoneum. Another investigator has furnished convincing proof of a true visceral pain (splanchnic) induced by tension of the hollow organs, and in addition to this the somatic pain originating in a sensitization of the posterior spinal roots and a radiation of painful sensations along the course of the corresponding spinal nerves to the skin and deeper tissue layers.

The peritoneal membrane lining the abdominal wall has received less attention from experimentors than the viscera, while the peritoneum covering the under surface of the diaphragm has remained almost *terra incognita* to surgical explorers who have been interested in charting areas of sensation by direct experimental methods.

The chief purpose of the studies reported in this article was to determine the localization of pain due to stimulation of the parietal and diaphragmatic peritoneum. The authors' experiments were carried out by a method previously employed by one of them in the study of sensation in the pleural cavity. After partial anæsthetization of the skin with ethyl chloride, a trocar was inserted through the abdominal wall until the end moved about freely. The point was then withdrawn and through the cannula a long silver wire, one end of which was beaded and smooth and the other relatively sharp, was passed. Both ends were slightly curved in order that they might be brought more easily into contact with the abdominal wall. In the earlier experiments patients with ascites were chosen because the fluid distended the wall and facilitated exploration. Recently, however, air has been injected, a method which has proved harmless.

The results of the experiments are summarized as follows:

1. The parietal peritoneum and its underlying serosa, so far as explored, namely, all the anterior median areas and the lateral areas as far as the anterior superior spines, are sensitive to pain from the strong pressure of a smooth point or the light pressure or lateral movement of a rough point of wire.

2. The pain elicited by stimulation of the parietal peritoneum is localized with considerable accuracy by the patient, the error being less than 1 in.

3. The observations confirm the conclusion of Ramstroem and Lennander that the parietal peritoneum is devoid of pressure sense.

4. The peritoneum covering the diaphragm is devoid of the sense of pressure as applied by light contact or stroking with a beaded wire point, but is acutely sensitive to strong pressure with a beaded point and to light contact with a rough point.

5. The location of pain from stimulation of the diaphragmatic peritoneum is never in the diaphragm itself. It is always referred to some distant part. Stimulation of the outer margin causes diffuse pain over the lower costal region and subcostal abdominal wall. Stimulation of the central portion causes pain over a sharply limited point somewhere along the trapezius ridge. These impulses are doubtless carried by afferent fibers of the phrenic nerve to the cervical cord of the fourth cervical segment. The pain has not been noted along the course of the phrenic nerve itself.

GEORGE E. BEILBY, M.D.

GASTRO-INTESTINAL TRACT

Wilson, R. T.: Peptic Ulcer. *J. Radiol.*, 1922, iii, 524.

The records of 2,844 patients examined roentgenologically for gastro-intestinal disturbances or symptoms or signs referable to pathology of the digestive system were studied. In 363 cases the roentgen diagnosis was peptic ulcer. In 126 of these the lesion was believed to be a gastric ulcer, and in 237, a duodenal ulcer. One hundred and eleven of these cases came to operation and in 105 of them the X-ray diagnosis was confirmed. Among the 2,481 cases in which the diagnosis was negative there were five in which peptic ulcer was found at laparotomy.

As a result of these studies the author is convinced that such indirect signs as variations in peristalsis and retention beyond the usual limits are of doubtful value in the diagnosis of peptic ulcer. He regards deformity as the one unfailing positive sign. More reliance is to be placed upon the fluoroscopic examination than upon roentgenograms. The latter are of value only as a record, for confirmation, or for demonstration. In no case was a lesion demonstrated roentgenographically that had not been seen previously on the fluoroscopic screen.

ADOLPH HARTUNG, M.D.

Einhorn, M.: Peptic Ulcer with Deformities of the Viscus, Evidenced by the X-Rays, Changed for the Better by Treatment. *N. York M. J. & Med. Rec.*, 1922, cxvi, 613.

As it is claimed by some surgeons that the true chronic gastric ulcer evidenced by typical clinical and roentgen findings can be cured only by surgical treatment, the author presents twelve cases of peptic ulcer in which the results demonstrate un-

equivocably the success of medical treatment. In all of these cases constant deformities were seen on roentgen examination. Five showed a typical penetrating (callous) ulcer of the lesser curvature; one, a penetrating ulcer of the pylorus; and six, constant deformities of the cap. These twelve cases were treated by duodenal alimentation. Subsequent roentgen examinations revealed normal configuration of the stomach and duodenum. There was also a return of general well-being.

A few of these cases are reported in detail but the histories of the rest are given in table form. Roentgenograms and outline sketches of the deformities before and after treatment are included in the article.

On the basis of his experience the author concludes that as a general rule most varieties of peptic ulcer, even the graver forms, are amenable to medical treatment. Duodenal alimentation was applied in his cases as a good method of resting the affected part and giving it ample nutrition. Einhorn does not doubt that similar results may be obtained by other methods of treatment, but claims that other methods take somewhat longer to effect a cure.

ADOLPH HARTUNG, M.D.

Hammer, A. W.: Cancer of the Stomach. *N. York M. J. & Med. Rec.*, 1922, cxvi, 634.

More than 30 per cent of all cancers in civilized man are found in the stomach. Heat is considered by many a predisposing cause. Locomotive engineers whose skins are for years exposed to the heat from the fire box of the engine develop cancer of the legs. Australians develop cancer of the face which originates from heat irritation. Chinese men who eat their rice extremely hot have cancer of the throat and œsophagus, while their wives, who eat later and usually of colder rice, do not have this cancer.

The percentage of cancers of the stomach originating in ulcers is given variously. One author says 3 per cent, Mayo-Robson says 50.3 per cent, and the Mayo Clinic, 60 per cent.

Hammer mentions five types of operation done for gastric cancer but discusses gastrectomy primarily. For a successful outcome it is necessary that gastrectomy be done before there is extensive lymphatic involvement, before extensive adhesions have formed, and before secondary growths have developed. Even total removal of the stomach is in no way incompatible with good health and long life. Mayo is quoted as reporting nine operations in which the entire stomach was removed, only enough of the gastric tissue being left for anastomosis. Of 651 patients subjected to resection of the stomach one lived fifteen years after the operation and sixty-two lived five years or longer.

Mayo-Robson says, "I cannot help feeling that far too gloomy a view is taken of cancer of the stomach for if the disease is caught early and a wide excision is performed, care being taken to remove the lymphatic area of the stomach with the glands along the lesser curvature, results of a most favorable nature will award our endeavor."

The roentgen ray is of the greatest value in the diagnosis. In 95 per cent of cases of gastric carcinoma the ray will show the condition before the development of appreciable symptoms. A persisting anæmia calls for such an examination.

P. W. SWEET, M.D.

Cromarty, R. P. Some Observations on the Surgery of Duodenal Membranes, with a Call-In Report of the Results of Treatment. *Canadian M. Ass. J.*, 1922, xii, 876.

Duodenal membranes were removed in forty cases operated upon at the Bigelow Clinic in the last two and one-half years. Such membranes vary from sheets closely overlying the duodenum and fixed at the omental and mesocolic attachments to dense cord-like bars spreading out over the duodenum from the liver or colon. Those of the latter type cause a distinct constriction, while those of the former type produce a longitudinal puckering of the duodenal wall and interfere with its muscular function.

Duodenal membranes are frequently present in cholecystitis, but may or may not be attached to the gall-bladder.

A study of many cases demonstrates that these membranes cause very definite symptoms. In order of frequency, those most common in cases operated upon were: (1) a gnawing or cramping pain in the epigastrium in 75 per cent; (2) tenderness in the epigastrium in 56 per cent; (3) eructations of gas in 50 per cent; and (4) nausea or vomiting in 42 per cent. Seventy per cent of the patients have hyperacidity of the gastric contents. The condition differs from duodenal ulcer in that the pain is persistent, pulling, and gnawing, and may be made worse by the ingestion of food, jarring, and lifting. Tenderness is usually persistent. Cholecystitis is differentiated by the location of the pain and the tender point on the skin.

The final diagnosis has been made on the basis of the fluoroscopic findings which vary with the site of the membrane. The duodenal cap may appear to have been sheared off on one surface and will not fill properly. The filling defect is frequently smooth and regular without the acute indentations found in ulcer. The cap may be spastic and fill only under much pressure. The cap and the first part of the duodenum may be drawn vertically upward out of the normal location. The second part of the duodenum may be drawn upward and to the right. The findings show mechanical interference.

Some cases have been diagnosed first as neurosis or chronic appendicitis with reflex gastric spasm. Medical treatment does not give relief.

In the author's opinion the membranes are usually due to inflammation, probably inflammation of the gall-bladder or that due to duodenal ulcer or localized peritonitis.

Surgical treatment necessitates free exposure of the duodenum. Fibrous or cord-like membranes

are cut parallel to the duodenum through avascular parts, trimmed, and then allowed to retract after ligation of the bleeding points. Membranes closely applied to the duodenum must be elevated and cut without damaging the peritoneal coat. The duodenum is in no way loosened from its attachments. After all the membrane has been removed the surface of the duodenum is covered with sterile vaseline.

The results in the cases operated upon as determined by a questionnaire showed: (1) symptoms as a whole much improved, 80 per cent, slightly improved, 55 per cent; (2) epigastric pain present in 61 per cent, cured, 33 per cent, relieved, 55 per cent; (3) belching of gas present in 60 per cent, improved, 55 per cent; (4) epigastric tenderness present in 50 per cent, cured in 47 per cent, relieved in 29 per cent; and (5) nausea and vomiting present in 30 per cent, relieved in 80 per cent. In the absence of epigastric pain and tenderness, surgical removal of the duodenal membranes gave the poorest results.

The author concludes that this syndrome, together with the fluoroscopic findings, establishes the entity of duodenal membranes, and that surgical measures are justified. WALTER C. BURKE, M.D.

Jewesbury, R. C.: Two Cases of Duodenal Obstruction in Infants. *Proc. Roy. Soc. Med.*, Lond., 1922, xvi, Sect. Study Dis. Child., 10.

CASE 1. Congenital stenosis of the duodenum. A full-term female child, who was apparently normal at birth, began to have attacks of projectal vomiting of bile-stained material on the third day. These attacks recurred two or three times a day, about one hour after feedings, with the exception of the thirteenth, fourteenth, and fifteenth days. On its admission to the hospital on the nineteenth day the child was emaciated, weighing only 4 lbs., 9½ oz. The legs were drawn up, and there was marked peristalsis from left to right every half to one minute. A rounded swelling extended from the left costal margin downward to below the umbilicus and to the right costal margin where a small indefinite mass was felt. X-ray examination demonstrated a greatly distended stomach and dilation of the first and second portions of the duodenum. Very little food had passed after two hours. The child had small infrequent bowel movements, continued to vomit after feedings, and died on the twenty-ninth day.

Postmortem examination showed the stomach to be grossly hypertrophied. The pylorus was not thickened, but the pyloric lumen was larger than normal. The first and second parts of the duodenum were dilated and the duodenal walls thickened because of obstruction due to marked constriction in the third part. There was no evidence of external compression.

CASE 2. Congenital obstruction of the bowel at the duodenojejunal juncture. The patient was a wasted, slightly jaundiced male child, aged 9 days, who had had attacks of projectal vomiting of bile-stained material since he was 3 days old. The stomach was dilated and showed peristalsis from left to right. The stools were intermediate between meconium and a milk stool. After taking 2 oz. of breast milk the child became uncomfortable and vomited a larger quantity of fluid than he had ingested. Roentgen-ray examination after a bismuth meal showed retention of most of the meal for nineteen hours. Constriction of the first and second parts of the duodenum was suggested. The child vomited after every feeding and died on the thirteenth day.

Autopsy revealed a markedly dilated and hypertrophied stomach and duodenum. Below the duodenojejunal juncture the bowel was very small and shrunken. The cæcum was abnormally high under the liver. Obstruction in the duodenum was caused by pressure from external structures, particularly the right colic artery. There was no abnormal narrowing of the duodenum itself.

A helpful factor in the differential diagnosis between pyloric and duodenal obstruction is the bile-stained vomitus which appears in duodenal obstruction. Thompson has seen three cases of pyloric stenosis, confirmed by postmortem examination, in which the vomitus contained bile. Marked visible peristalsis occurs much later in pyloric stenosis than in duodenal obstruction.

The author believes that gastrojejunostomy is the operation of choice if the patient is seen early, the diagnosis is correctly made, and the child is strong enough to withstand surgical treatment.

The author quotes Cautley's summary of the characteristics of duodenal stenosis. Vomiting with the usual signs of obstruction is the characteristic feature and may occur from distention due to normal secretion without the ingestion of food. In 90 per cent of the cases the vomitus is bile-stained. Hæmatemesis is not uncommon. Inanition, wasting, and constipation are marked. Dilation and hypertrophy of the stomach and the first part of the duodenum are associated with marked gastric peristalsis. Many of the cases are those of premature infants.

WALTER C. BURKE, M.D.

Kleinschmidt, P.: The Treatment of Carcinoma of the Papilla of Vater (Zur Behandlung des Carcinoms der Papilla Vateri). *Deutsche med. Wchnschr.*, 1922, xlviii, 1107.

Two cases of obstruction of the common bile duct by a tumor at the papilla of Vater are reported. In both, the diagnosis of neoplasm was made after incision of the anterior wall of the duodenum and circumcision of the papilla.

The localization of a tumor in the common bile duct can be established only after exposure. Theoretically the best method of operation is resection of the duodenum from the pylorus up to the inferior horizontal portion. From the practical standpoint, however, this is applicable only rarely as the patient's condition is usually poor and the surgeon must confine himself to excision of the tumor. The only permanent cure reported was due to excision.

CARL (Z).

Lane, W. A., Waugh, G., Gray, H. M. W., Paterson, H. J., and Walton, A. J.: The Treatment of Non-Malignant Affections of the Colon. *Brit. M. J.*, 1922, ii, 1014.

SIR W. ARBUTHNOT LANE

All abnormal conditions of the colon are direct or indirect results of intestinal stasis. There are two groups: those in which reaction is present, and those in which reaction is absent.

Stagnation of the intestinal contents in the pelvic colon causes the formation of bands on the under-surface of the mesentery supporting the juncture of the iliac and pelvic colon. These bands soon develop into a distinct membrane, the "first and last kink," which gradually contracts, fixing the colon in the iliac fossa and diminishing its lumen by angulating it and rotating it on its long axis. The fallopian tube and ovary may also become fixed by this membrane, a condition which may result in extra-uterine pregnancy, sterility, cystic disease of the ovary, and particularly in pain on the left side at the menstrual period due to the passage of intestinal contents through an obstructed bowel over an engorged ovary. Persistent obstruction at the ileopelvic juncture of the colon makes this point a common site of cancer, and the colon proximal to it a common site of diverticulitis.

The increased blood in the obstructed bowel causes the formation of similar membranes reinforcing the peritoneum where it passes from the abdominal wall to the convex surface of the bowel—immediately above the iliac crests, at the splenic flexure, below the gall-bladder, over the outer surface of the cæcum (Jackson's membrane), and on the under-surface of the terminal mesentery of the ileum (Lane's kink). These bands represent the effort of the organism to counteract an abnormal loading up of the bowel due to distal obstruction. That they are not congenital is indicated by their absence in fifty-two newborn fetuses examined by Chapple at Guy's Hospital. The "controlling appendix" is another result of strain exerted by a loaded cæcum, the appendix becoming fixed by adhesions to the undersurface of the mesentery. When the ileum and cæcum drop into the pelvis, the ileum is kinked sharply over the fixed appendix and more or less occlusion results.

The second type of intestinal stasis is characterized by entire absence of a tendency to form limiting bands and membranes. The pelvic colon becomes greatly elongated, tortuous, and flaccid by reason of the attempts of the organism to expel its contents. Because of the obstruction of the lower bowel, the proximal colon becomes elongated and prolapsed so that it may twist and obstruct the end of the ileum. The latter condition may be benefited by plicating the bowel or anchoring it by Waugh's method. The obstruction to the passage of intestinal contents resulting from elongation of the pelvic colon results in colitis, spastic contraction of the muscle wall, and still further mechanical obstruction. Since there is no definite point of obstruction, cancer does not commonly develop from this type of intestinal stasis.

The operative treatment of the first type of stasis is resection of the bands which form the "first and last kink," followed by careful peritonization of all raw surfaces. Other bands, if present, should be divided. If the membrane forming the ileal kink is extensive, a drainage tube is left in position because of the presence of septic organisms in the divided lymph vessels of the membrane. If diverticulitis is present, the divided end of the ileum is joined to the pelvic colon. Occasionally the diseased area is resected and the proximal bowel joined to the pelvic colon. If tuberculous ulceration is present, colectomy is performed or the ileum is joined to the pelvic colon and only the affected area is resected.

In the second type the best results are obtained by colectomy or by anatomosis of the ileum to the pelvic colon. If volvulus is present it is possible to resect the volvulus or to perform a colectomy. The same treatment applies to megacolon. If medical treatment fails to cure ulcerative mucous and membranous colitis, colectomy is the only operation of value. For the first condition, prolonged local and vaccine treatment is necessary in addition.

GEORGE WAUGH

The colon, subject as it is to constant accretions of intestinal contents, must be perfect in its development to withstand the strain which gravity imposes upon it. Imperfect development of the colon, omentum, biliary apparatus, and small intestine must be carefully studied in order to understand and correct functional disabilities of the alimentary tract.

In 110 children under 12 years of age examined post mortem by Stallman at the Hospital for Sick Children, the following structural variations were found: in thirty-eight, the youngest of whom was 1 month old, there was a complete primitive mesentery to the ascending colon; in nine, the youngest 2 months old, a long primitive mesentery to the iliac and pelvic colon; in fourteen, the youngest 1 month old, Lane's parietocolic membrane; and in forty-five a ventral mesentery to the gall-bladder. In one, the cæcum was under the liver.

In every one of 188 adults and twenty-two children operated upon since December, 1919, the ascending colon had retained its primitive mesentery. In 177 cases the entire ascending colon could be lifted out of the abdomen and placed upon towels to the left of the midline; in thirty-three it was bound down strongly at the midpoint, the primitive mesocolon persisting in variable degree above and below this point. This fixation was caused by an opaque, non-vascular band passing from the antero-external surface of the ascending colon to the parietal wall. When the band was cut the cellular tissue covering the quadratus lumborum was exposed. It had no features in common with Jackson's membrane, being the structure described by Lane in 1903 as the parietocolic membrane.

In two cases of the operative series the entire colon lay in the left iliac fossa and the left side of the pelvis, and retained a primitive dorsal mesentery throughout its length. In five cases the cæcum lay under the liver; in three of these the colon passed directly to the left from the cæcum and the omentum arose from the entire horizontal loop; in the other two, the colon dropped abruptly, so that the hepatic flexure lay in the pelvis. In these five cases the terminal ileum made a steep vertical ascent to reach the cæcum and was retroperitoneal in this portion of its course. In two cases the colon was completely rotated, but had dragged with it an opaque membrane which covered all the remaining viscera except the stomach.

In 128 cases the transverse colon lay at or below the sacral promontory. The degree of associated prolapse of the stomach was variable, depending upon variations in attachment and the length of the omentum. Prolapse of the stomach without prolapse of the colon was never seen.

With these variations of position and mobility the colon showed atrophy and dilation which involved the ascending portion in every case, the right half of the transverse colon in ninety-eight cases, and the entire transverse colon in thirty cases. Similar changes were found in parts of the descending colon which were excessively mobile. In five cases, all those of persons under 30 years of age, the entire colon was atrophic and dilated from the cæcum to the rectum.

In the majority of these cases the initial symptoms appeared between the ages of 18 and 25, and consisted of persistent discomfort in the upper half of the abdomen which gradually, in the course of a year, merged into pain generally noted in the upper half of the abdomen, but subject to variations in distribution, conduction, and character. In ninety-seven cases there was a hunger pain, which frequently could be relieved by the assumption of the horizontal position and the ingestion of food.

This fact, taken in conjunction with the fact that the hunger pain appeared constantly at 4 o'clock in the afternoon and in the early hours of the morning, a time at which the ascending colon is filled with food, suggests very strongly that the pain is caused by the downward pull of the loaded colon on its mesentery. The relief from pain afforded by fixation of the colon further confirms this view.

None of these patients had duodenal ulcers which could be found at operation; all had lost weight. In only twenty-eight cases had constipation preceded the other troubles, and in most of them its appearance was delayed for four or five years after the beginning of the trouble.

In forty-six cases the appendix had been removed; in five, the gall-bladder had been drained; and in nine a gastrojejunostomy had been performed.

The operative procedures carried out in these 210 cases were as follows:

In all of them the ascending colon was fixed to the posterior abdominal wall in the normal position. The atrophic right half of the transverse colon was fixed by Coffey's method in 128; the ventral mesentery of the gall-bladder, found in seventy-six cases was cut away; the gastrojejunostomy union was undone in six. The appendix, still present in 164 cases, was removed. In four of these it was obviously diseased. A total colectomy or a short-circuiting operation was never done. The operative mortality (including 308 cases previously reported) was less than 1 per cent.

Late complications included eight cases of intestinal obstruction due to adhesions which were observed during the past eleven years. In six of these a knuckle of small bowel was adherent to the under-surface of the laparotomy wound, and in two the omentum was adherent in the pelvis.

The results can be grouped roughly as failures, improvements, and apparent cures. Twenty patients report they are no better. A second group, though not entirely free from their old symptoms, have been materially benefited. Ninety-eight, after periods ranging from eight to five years, are entirely well. The rate of improvement has been slow in some and abrupt in others.

The essential principle involved in this study is that in many cases functional disability of the gastro-intestinal tract is due to congenital structural defects which finally reveal their presence by failure of function. The removal of these defects and the substitution of a normal for an abnormal condition affords the essential condition for cure.

SIR H. M. W. GRAY

Since the first part of the colon sets the pace for the rest of it, adhesions and bands about the cæcum and ascending colon are of primary importance. That pericolonic adhesions are formed in the process of development is indicated by the work of Bryant, who found bands such as are described by Lane in all of the male fetuses and in 87.5 per cent of the female fetuses he examined.

As the cæcum descends from the subhepatic region in the course of normal development, the long mesentery, with which the terminal ileum and ascending colon are originally provided, becomes fused with the peritoneum of the posterior abdominal wall. If delay in the descent of the cæcum occurs, this fusion, having already taken place, may interfere with the descent. The resulting abnormality—whether it is a stretched-out band, Lane's terminal ileal membrane, a membrane reaching the antemesenteric border of the ileum and rotating it on its long axis, or simply a number of fibrous tags—represents the balance between the downward pull of the cæcum and the tendency of the ileum to remain fixed.

The chief cause of non-descent of the cæcum is involvement in an abnormally developed right margin of omentum. If the cæcum overcomes this obstruction, the affected part of the omentum is drawn out into Jackson's membrane. Usually this membrane can be traced below and internal to the anterior longitudinal band. In the adult it does not

often reach the cæcum. Above, it is attached to the posterior abdominal wall below the liver, occasionally to the under-surface of the liver external to the gall-bladder, and to the adjacent anterior abdominal wall as well. It varies greatly in obliquity, length, and thickness.

If the descent of the cæcum is retarded by omental adhesions, the appendix usually comes to lie in a retrocolic or retrocæcal position, external to the cæcum. If the appendix lies internal to the cæcum, it may become involved in the obliteration of the terminal mesentery of the ileum. This is the origin of the type described by Lane as the "controlling appendix."

Gray's experience differs from that of Waugh as Gray does not often discover a true ascending mesocolon, but finds that a more or less definite Jackson membrane is constantly present. The abnormal drag of the cæcum and colon upon the right margin of the omentum causing a potential constriction of the pylorus and duodenum may account for the symptoms referred to the right upper quadrant in these cases.

By consistently securing an adequate exposure in performing laparotomy, Gray finds abnormalities at one or more parts of the colon in the majority of his cases. On the other hand, an apparently normal colon, as outlined by X-ray examination, is frequently present in patients suffering from chronic constipation. The latter is due, in Gray's opinion, to lesions of the upper part of the gastro-intestinal tract more frequently than to disease of the colon.

The symptoms ascribed by Waugh to the drag of a heavily laden colon, and frequently assigned to the stomach, duodenum, and gall-bladder, often appear within a few years after the patient has begun to lead a sedentary life. They begin with a loss of tone of the abdominal muscles, which is doubtless shared by the musculature of the alimentary canal. A large number of patients with these symptoms can be helped by operation.

The conditions commonly found at operation in such cases are the absence of disease of the gall-bladder, duodenum, and appendix, and the presence of peritoneal bands such as those just described, with a mobile, dilated, hypertrophied cæcum and ascending colon and a pathologic appendix. It is not sufficient to remove the appendix and divide the peritoneal bands. The cæcum and colon must be fixed in a normal position, as was advocated by Wilms in 1908. If the patient's condition permits, this is now done in the course of a laparotomy in every case of mobile cæcum and ascending colon.

In performing this operation the filmy tissue behind the colon should be removed so that the colon may form firm adhesions to the posterior abdominal wall. The hepatic flexure should not be unduly kinked by the upper sutures. The cæcum and colon are usually plicated in a longitudinal direction by catching the anterior and external longitudinal bands in the fixation sutures so as to narrow the circumference of the bowel.

H. J. PATERSON

In many cases of intestinal stasis the symptoms are mainly gastric—distention, flatulence, pain after eating, occasional vomiting, absence of free hydrochloric acid. Relief of the stasis by a short-circuiting operation is followed by symptomatic improvement and the return of the secretion of free hydrochloric acid.

The charcoal test is of value in determining which cases of intestinal stasis should be operated upon. In the absence of definite evidence of a kink or a diseased appendix, operation is not indicated unless the appearance of charcoal taken by mouth is delayed for four days. Deductions drawn from roentgenological and bacteriological examinations should not be allowed to outweigh the evidence afforded by this simple clinical determination.

If there is definite evidence of kinks or obstruction, surgical treatment is indicated, but if the stasis is due to atony of the large bowel or the presence of a large mobile cæcum, it can usually be corrected by medical and mechanical treatment. The division of bands is a satisfactory operation unless the bands are very extensive. In the latter case, because of the danger of postoperative ileus, colonic exclusion is preferable. Ileosigmoidostomy is an unsatisfactory operation because of the accumulation of fæces in the inactive transverse and ascending colon. In twenty of forty-one cases it was necessary to perform a second operation to remove the colon above the ileosigmoid anastomosis. The results of partial colectomy, as far as the relief of symptoms is concerned, are excellent, but in six of twenty-seven cases a second operation was necessary later for the relief of intestinal obstruction. Paterson has never performed a primary colectomy, but of the twenty patients on whom colectomy was performed secondary to ileosigmoidostomy, six developed intestinal obstruction. Because of the danger of this complication, total colectomy is contra-indicated in the treatment of intestinal stasis. With regard to the value of fixation of the ascending colon Paterson is skeptical.

The operation of colonic exclusion is performed as follows:

The ileum is crushed and divided with the cautery 4 to 6 in. from the ileocæcal valve, and the ligated distal end inverted with a purse-string suture. The proximal ileum is then joined to the side of the sigmoid, and the stump of ileum distal to the anastomosis is inverted so as not to leave a blind pouch. The sigmoid is divided in the same way, 1 in. above the anastomosis. The closed tube left behind, consisting of the cæcum and the ascending, transverse, and descending colon, is drained by bringing the appendix or cæcum to the abdominal wall and tying a large catheter in the cæcum.

Of nineteen cases in which this operation was performed the results were excellent in sixteen. One patient died sixteen days after the operation from suppuration in the right iliac fossa, one died eighteen months after the operation from perfora-

tion of a stercoral ulcer, and one has had attacks of pain from time to time due to distention of the cæcum with gas.

The operation has all the advantages of colectomy without the danger of later intestinal obstruction.

A. J. WALTON

Kinks and bands are not so common as has been suggested. They are usually congenital and may be found in very young children. Symptoms of chronic stasis appear chiefly in women, but the bands and membrane described are equally common in males and females. Ptosis does not necessarily cause stasis, as many women who have had frequent pregnancies and who show a profound degree of ptosis do not have symptoms of stasis. The explanation of the increasing frequency of visceroptosis in young women today may lie in the lack of development of the involuntary muscles.

Stasis is a medical disease. Operation should be performed only if medical treatment has failed absolutely, and only in very advanced cases. Stasis is not relieved by removal of the appendix or fixation of the cæcum. SUMNER L. KOCH, M.D.

Richter, J.: Atypical Operations—Especially a Safe Subtotal Extirpation (Exclusion of the Tip) of the Appendix—in Cases of Severe Adhesions Due to Appendicitis (Ueber atypische Operation — insonderheit einen Fall von nicht totaler Ektomie (Ausschaltung) der Wurmspitze mit Sicherung — bei schwerster Adhaesionsbildung durch Appendicitis). *Deutsche Zeschr. f. Chir.*, 1922, clxxi, 423.

In a case of severe cicatricial adhesions between the appendix and small intestine and between the small intestine and the pelvis the author effected nearly complete separation of the appendix from the indurated adhesions in a secondary operation. As further separation toward the tip was impossible because of the fixation of the small intestine, the tip was left adherent to the small intestine, closed blindly at its proximal end, and with the attached wall of small intestine invaginated into the lumen of the gut. The freely dissected piece of appendix was removed and the stump treated in the usual manner.

Although there has been much criticism of Hofman's procedure in which, in severe cases of adhesions, the entire appendix, after being excluded, is left in the abdominal cavity, the cæcum and proximal end of the appendix being closed by suture, Richter believes his own technique, which is intended only as a last resort after other measures have failed, offers relatively good protection from recurrence. HOHLFELD (Z.).

Carter, R. F.: The Pre-Operative and Postoperative Treatment for Colon Malignancy *N. York M. J. & Med. Rec.*, 1922, cxvi, 630.

Co-operation of the surgeon, the internist, the bacteriologist, and the physiologist is essential for success in operations on the colon for malignancy.

Complete obstruction of the colon by a growth must be relieved at once by operation, regardless of the patient's general condition. A growth at the ileocæcal valve may cause symptoms of obstruction early, but a growth in the right half of the large bowel may attain a considerable size and form metastases before it produces symptoms because the contents of this part of the colon is liquid or semisolid. Catharsis and irrigation will clean the large bowel sufficiently for a one-stage operation.

Cleansing of the bowel proximal to a growth in the left half of the colon is a much more difficult problem and can be accomplished only by establishing an artificial anus proximal to the growth for external drainage and irrigation. As the lumen of the bowel decreases, the flow of contents becomes lessened, the absorption of the liquids becomes greater, and hard masses of fæces are formed which will not pass the obstruction and resist all forms of purgation. The complete removal of these scybala and the cleansing of the colon of septic material is the most important step in the preparation for excision of the growth.

Catharsis should never be drastic and should never precede a preliminary operation in the presence of partial obstruction or attempted during the last thirty-six hours before operation as it tends to produce spasticity of the colon during the operation, painful contraction afterward, and dehydration.

The portion of the bowel distal to the growth is best cleansed by injecting 6 to 10 oz. of oil followed in eight hours by a soap-suds enema given until the return is clear. A sodium-bicarbonate enema is then given and repeated daily until four hours prior to the operation.

In a normal colon the virulence of the bacteria diminishes as the contents become more solid. In the presence of an obstructing growth the entire colon proximal to the growth becomes a favorable breeding ground for virulent bacteria. Drainage of the colon proximal to the growth is therefore essential to decrease the septicity of the bowel contents. If this cannot be accomplished through the rectum, an artificial anus should be established.

After the operation, ¼ gr. of morphine followed by ¼ gr. whenever necessary for forty-eight hours will control the pain. Continued colicky pain after this, which is not relieved by the colon tube, strongly suggests intestinal obstruction. Œdema of the anastomosis of normal bowel may sometimes cause sufficient stenosis to produce painful peristalsis. This should disappear in forty-eight hours. If the proximal colon had been distended, external drainage through a cæcostomy or enterostomy opening is indicated at the time the resection is done.

An ascending retroperitoneal infection causes no pain, but pain in the wound five to seven days after the operation suggests wound infection and clipping a stitch or two will give instant relief. Painful excoriation may be relieved by the application of petrolatum to the wound area.

The administration of fluid is the most important postoperative consideration and should be begun immediately following operation by hypodermoclysis

sis with a 3 per cent glucose solution given under the breast or in the flank. It may thus be given slowly over a long period of time. Four ounces of fluid may be injected into the rectum with safety every four hours if the injection is preceded by the passage of a colon tube. Glucose and sodium bicarbonate should not be given intravenously unless a chemical analysis of the blood is first made. When a blood analysis is not made, normal saline should be used.

Vomiting after ten hours is due to acute dilatation of the stomach (which is rare), neurosis, acidosis, or pelvic peritonitis. Specific treatment for the acidosis will clear it up quickly. In other cases gastric lavage will give relief. PAUL W. SWEET, M.D.

Collins, F. K.: Aseptic Resection of the Intestine. *Ann. Surg.*, 1922, lxxvi, 740

The method described for aseptic resection of the intestine is a method of end-to-end anastomosis and immediate restoration of the intestinal lumen by the use of a removable looped ligature. The operation is a modification of a procedure devised by Halsted which consisted of a blind-end circular suture of the intestine with the closed ends abutted and puncture of the intervening diaphragm by means of a knife introduced through the rectum. H. W. FINK, M.D.

Horine, C. F.: Aseptic Technique for Resection of the Intestine. *Ann. Surg.*, 1922, lxxvi, 745.

In the author's method of resecting the intestine aseptically the portions of the gut proximal and distal to the portion to be removed are isolated by means of a pursestring suture of heavy silk or linen thread. The suture is begun at a point distal to the mesentery so that when it is tied the knot will be above, facing the operator. All coats of the intestine except the mucous coat are included. A clamp is then placed between the two pursestring sutures on each end of the intestine to be resected. The mesentery is dealt with in the usual way and the segment of gut is removed by dividing it between the clamp and suture with the electric cautery. Before the pursestring suture is completed two release strings free at the ends are placed between the two knots so that they may release the pursestring at a later stage of the operation.

The proximal and distal stumps are then brought into apposition and joined by interrupted mattress sutures of intestinal silk. The release strings are carried out between the mattress sutures, and as the two ends are approximated they are released two at a time, a communication of the canal being thus established after the two ends have been sealed by the mattress sutures. The pursestring which has thus been opened remains in the gut lumen and is carried through the bowel to pass out with the contents of the gut.

This operation has been performed on ten dogs and two patients.

The article contains numerous illustrations.

H. W. FINK, M.D.

McVay, J. R.: Involvement of the Lymph Nodes in Carcinoma of the Rectum. *Ann. Surg.*, 1922, lxxvi, 755.

Rectal carcinomata are the most common intestinal neoplasms and constitute 4 per cent of all cancers. The majority of patients are in the sixth decade of life. The incidence of the condition is slightly greater in males than in females. The duration of the symptoms is usually less than one year. The location of the growth on the rectal wall varies, but the anterior and posterior walls are involved with about equal frequency. The greater number of the growths are found between the ampulla and the rectosigmoid juncture. Adenocarcinoma is the most common type of growth. Metastasis to the glands usually takes place slowly. The liver is the organ most often affected by secondary growths. The other organs of the body are only rarely affected.

The size of the growth in the rectum cannot be relied on as an accurate index of the probable lymphatic involvement. The neoplasms without lymphatic involvement tend to grow into the lumen of the bowel, while those with slight lymphatic involvement tend to spread by direct extension and grow slowly. Carcinomata of the rectum with extensive involvement of the lymph glands tend to metastasize through the lymph stream early. Occasionally, metastases may be formed by emboli breaking off into the portal veins.

Metastatic involvement of the lymph glands can be definitely determined only by systematic microscopic study of all the regional lymph nodes. The size of the lymph nodes is not an accurate index of metastatic involvement. This is especially true if the involvement is slight or the process is in the early stages.

In carcinoma of the rectum, as in cancer of the stomach, systematic microscopic examination of all the regional lymph nodes is the best method of establishing an accurate prognosis.

One hundred specimens which had been removed at operation at the Mayo Clinic were studied. Six hundred and twenty-three glands were obtained from these specimens. In 53 per cent of the specimens there was no glandular involvement; in 30 per cent, slight glandular involvement; and in 17 per cent, marked involvement of the glands.

Quinland, W. S.: Congenital Malformation of the Intestine—Atresia and Imperforate Anus. *Boston M. & S. J.*, 1922, clxxxvii, 870.

Quinland reports and analyzes twenty-seven cases of congenital malformation of the intestine, most of them unpublished cases from the Anatomical Museum of the Harvard Medical School.

Imperforate anus, the most common intestinal anomaly, is due to imperfect union between the rectum above and the posterior part of the cloaca common to the urogenital aperture and hindgut below. The anal aperture may be separated from the rectum by mesodermal tissue an inch or more in

depth as the result of insufficient invagination of the ectoderm to meet the rectum which may end blindly above or communicate with the exterior by some unusual opening.

In another type, the embryonic anal plate persists without the slightest invagination of the skin in this region.

In cases of incomplete separation of the cloaca to form the urogenital sinus and rectum, the rectum opens into the bladder, or more commonly, in males, into the prostatic or membranous urethra. These cases are frequently unrecognized. More unusual openings of the rectum have been recorded. In one case the intestine was directed upward and opened under the border of the right scapula. In another it mounted from the pelvis through the chest and neck and opened on the face.

Of the various hypotheses as to the cause of atresia the theory most commonly accepted is that advanced by Tandler. In the embryo of 7 mm. the gut is divided into compartments by septa of proliferating lining epithelium so that in the embryo of of about 14 mm. the lumen may be completely occluded. In the embryo of 30 mm. the compartments begin to become confluent, and in this way a central lumen is re-established. When some of the septa fail to disappear, a more or less complete occlusion of the gut persists.

There may be many forms of this defect, resulting in blind ends not attached to each other or attached by a strand of serosa, muscularis, and submucosa, or a small epithelial tube joining the blind ends. In some cases a malformation which was originally a stenosis develops into atresia, a change which accounts for the fact that meconium is sometimes found distal to the atresia. Atresia of the intestine may occur in any portion of the intestinal tract, but its most common location is the duodenum and the jejuno-ileal regions. This is probably one of the rare forms of congenital malformation.

The prognosis is grave on account of the complications, viz., hæmorrhage, peritonitis, and septicæmia.

Because of the probability of an ascending nephritis, it is usually wise in cases of imperforate anus in which there is a connection between the lower end of the rectum and the bladder, to restrict operative measures to a permanent colostomy rather than to attempt to separate the rectum and bladder. If the child is a female, the prognosis is more favorable, especially if the rectovaginal opening is of fairly large size. If the occlusion is high up in the small intestine death usually occurs in five or six days.

The treatment is surgical and must be adapted to the requirements of the particular case. The perineal approach is sometimes futile because, as the incision must be relatively short, it is difficult for the surgeon to explore the deeper perineal structures to find the rectum, which may terminate high in the pelvis. In such event, enterostomy is necessary.

O. S. Procror, M.D.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Gordon, J. K.: Congenital Obliteration of the Bile Ducts and Congenital Biliary Cirrhosis of the Liver. *Boston M. & S. J.*, 1922, clxxxvii, 923.

From a review of the literature Gordon draws the following conclusions:

Mild or severe cirrhosis of the liver is found with congenital obliteration of the bile ducts.

A congenital biliary cirrhosis of the liver may occur without congenital obliteration of the bile ducts and is not a result of the latter condition.

In view of the otherwise hopeless outlook, surgical interference is advisable in all cases in which a positive diagnosis of congenital obliteration of the bile ducts has been made.

H. A. McKsight, M.D.

Goepel, R.: Can the Kehr Drainage of the Hepatic Duct Be Replaced by a More Complete Procedure? The "Ideal Cholelithotomy" (Kann die Kehrsche Hepaticusdrainage durch ein vollkommeneres Verfahren ersetzt werden? Die "ideale Cholelithotomie"). *Muenchen. med. Wchnschr.*, 1922, lxix, 1144.

The author discusses the deficiencies of Kehr's drainage of the hepatic duct. The measures so far suggested to overcome the difficulties have been unsuccessful because drainage to the surface of the body is based on false principles. Drainage should occur into the duodenum which is physiologically adapted to receive the bile, and this is possible only when there is a permanent wide connection between the common bile duct and the duodenum.

Slitting of the common bile duct beginning at the duodenum gives good results in cases of wedged-in calculi and should be done instead of drainage of the hepatic duct in cholangitis and cases of biliary sand and stones in the common bile duct when there is the slightest possibility that stones or stone fragments may be left behind. It is indicated also in cases of dilation of the common bile duct without stone (papillitis, pancreatitis).

Another procedure of value is the formation of an anastomosis as thick as a lead pencil between the common bile duct in the duodenum, in the acute angle where the common bile duct joins the duodenum. It is indicated less in cholelithiasis, however, than in chronic biliary stasis due to a tumor of the papilla or induration of the pancreas. The author discusses the technique and the advantages of the procedure briefly. Pflaumer [Z.]

Lichtenauer: The Relationship of Surgery to the Diseases of the Hepatolienal System (Die Beziehungen der Chirurgie zu den hepato-lienalen Systemerkrankungen). *Ztschr. f. aerztl. Fortbild.*, 1922, xix, 522.

General anæsthesia should be avoided in diseases of the hepatolienal system as chloroform has a very toxic effect on the liver and large amounts of

ether have also proved injurious. Operative procedures in such cases should be carried out under local anæsthesia combined with twilight sleep. Persons with disease of the hepatolienal system are subject also to hæmorrhage during, and particularly following, operation.

The surgical treatment of diseases of the liver is limited to the treatment of cirrhosis by the Talma operation. In diseases of the spleen, the conditions are more favorable as the spleen may be extirpated. In pernicious anæmia, extirpation of the spleen does not give a permanent result but is indicated as a palliative measure. Banti's disease and familial hæmolytic icterus are apparently cured by splenectomy. In two of the author's cases of pseudoleukæmic anæmia in infants splenectomy was followed by good results. Splenectomy is not indicated in leukæmia.

The author reports a case of Banti's disease in which he operated in the first stage; the blood picture and the general condition were considerably improved by the operation. RIESS (Z)

Ormos, P.: A Case of Torsion of the Gall-Bladder (Ein Fall von Gallenblasentorsion). *Gyogyaszat*, 1922, lxii, 484.

The patient, a woman 71 years old, died with the symptoms of hæmorrhagic colitis. When the abdominal cavity was opened at autopsy a markedly enlarged gall-bladder was found with a pedicle which originated at the juncture of its middle and lateral thirds. The gall-bladder was twisted around the pedicle and was necrotic. Surrounding the gall-bladder was a circumscribed zone of peritonitis one or two days old, and around the liver, duodenum, and gall-bladder a proliferation of connective tissue due to chronic inflammation. Peritoneal reduplications stretched between the duodenum, liver, and gall-bladder. The transverse colon and the sigmoid had a strikingly long mesocolon. The latter may have been a congenital anomaly. The colon showed a hæmorrhagic colitis which had been present for four weeks. Two days before death this condition became aggravated and there was severe abdominal pain which probably was due to the torsion of the gall-bladder. The condition was not diagnosed before autopsy. VON LOBMAYER (Z).

Franke, F.: The Ascaris Lumbricoides in the Biliary Tract (Der Spulwurm in den Gallenwegen). *Med. Klin.*, 1922, xviii, 1271.

The author states that the presence of ascarides in the biliary tract is by no means rare and that since the World War reports of such cases have become more numerous.

A case is reported in which incarceration of a gallstone was suspected because of pain under the right costal arch but at operation an ascaris was found in the common bile duct and no stone.

The most important complications are obstruction of the common bile duct, cholangitis, and hepatic abscess. Franke concludes that in every case of disease of the biliary tract a search should be made for the worm and its ova. In the presence of complications immediate operation is indicated. SONNTAG (Z).

Corkery, J. R.: Chronic Catarrhal Cholecystitis with Lipoid Deposit. *Ann. Surg.*, 1922, lxxvi, 736.

Papillomata of the gall-bladder occur as single or multiple lesions of the mucosa. They appear as white or yellowish bunches of grape-like bodies from 0.5 to 5 mm. in diameter insecurely attached to the mucosa by a very slender filament of tissue. The cellular changes are identical with those found in chronic catarrhal cholecystitis with lipoid deposit, namely, fish-scale and strawberry gall-bladder. The lipoid substance is seen in large polygonal cells or round cells in the submucosa and in the walls and lumina of blood vessels. It is usually deposited in the form of fine granules. Round-cell infiltration is noted in amounts proportional to the amount of lipoid deposited. The picture is that of an acute infection engrafted upon a chronic infection. Every case shows fibrosis, especially about the villi. The villi become broader at the base, shorter in the long axis, and enlarged at the tip so that they are almost spherical. In the formation of a papilloma the base of the villus becomes narrowed to a slender filament, a change which tends to cut off the blood supply and therefore favors necrosis and exfoliation of the papilloma. The only apparent difference between strawberry and fish-scale papilloma of the gall-bladder is the shape of the yellowish-white masses.

The clinical history, the surgical findings, and the postoperative results in cases of papilloma are indistinguishable from those of strawberry gall-bladder and fish-scale gall-bladder. The author believes that papilloma is not a neoplasm, but the result of chronic cholecystitis. The scarring and irritation and the resultant changes in the mucosa of the gall-bladder cause first a strawberry appearance, then a fish-scale appearance, and finally a papilloma appearance of the gall-bladder. A gall-bladder which is chronically inflamed may show one or all three of these pictures at different times in the course of the disease. H. W. FISK, M.D.

Lewis, N. D. C., and Reuter, F. A.: A Contribution to the Study of Connective-Tissue Changes in the Gall-Bladder. *N. York M. J. & Med. Rec.*, 1922, cxvi, 640.

This article is the report of a case of cholelithiasis in an insane woman 48 years of age. The walls of the gall-bladder showed extensive connective-tissue changes. Mitotic figures were not numerous but there were areas in which mitosis was an outstanding feature.

There was no metastasis, and the infiltration was limited to the surrounding structures, the liver and the cystic and common ducts. The authors hesitated to diagnose the condition as sarcoma although they felt that they might be dealing with a growth closely

resembling myxosarcoma which usually shows less tendency to metastasize than many of the other forms of malignancy. PAUL W. SWEET, M.D.

McClure, C. W., and Jones, C. M.: Studies in Pancreatic Function. *Boston M. & S. J.*, 1922, clxxxvii, 929.

Abnormalities in the enzymatic action of the duodenal contents were found by the authors in cases with an organic lesion involving the pancreas primarily or secondarily and in cases in which the clinical, operative, or autopsy findings indicated derangement of the external secretory function of the pancreas. From this fact it seems fair to assume that such abnormalities show pathologic involvement of the pancreas or its ducts, and that the involvement of the pancreas may be mechanical or functional. It is therefore justifiable to conclude that the enzymatic action of the duodenal contents indicates the activity of the external secretory function of the pancreas.

In achylia gastrica and pernicious anæmia no abnormalities in the activity of the external secretory function of the pancreas as measured by the enzyme concentration of the duodenal contents were demonstrable. These findings suggest that the presence of hydrochloric acid is not necessary for the stimulation of normal pancreatic secretion.

The external secretory function of the pancreas was found much depressed in chronic pancreatitis.

Acute pancreatic necrosis, cancer of the head of the pancreas, and lesions obstructing the pancreatic duct were accompanied by marked abnormalities in the enzymatic action of the duodenal contents. Obstructive lesions caused a marked decrease, while acute necrosis usually caused dissociation.

The estimation of the enzymatic action of the duodenal contents furnished findings of value in the differential diagnosis between benign and malignant lesions causing obstructive jaundice.

Acute and chronic cholecystitis and infectious jaundice were accompanied by dissociation of enzymatic action of the duodenal contents.

The method used by the authors to study the duodenal contents was as follows:

A duodenal tube was allowed to enter the second portion of the duodenum, its position being verified by fluoroscopy. The patient was then given 4 c.cm. of 20 per cent cream in which 15 gm. of barium sulphate were suspended. As soon as the flow had begun in the tube, the duodenal contents were siphoned off and collected for one hour after the barium appeared. Proteolytic activity was estimated by allowing a dilution of the duodenal contents to act on a solution of soluble casein. Amylolytic activity was estimated from the number of milligrams of glucose developed by the action of the duodenal contents on a solution of soluble starch. Lipolytic activity was estimated by allowing the duodenal contents to act on a true emulsion of cottonseed oil, and determining the amount of acidity developed by titrating with a tenth-normal alcoholic solution of sodium hydroxide.

H. A. McKNIGHT, M.D.

Bouman, H. A. H.: A Pancreatic Cyst in the Left Hypochondrium Extirpated. *Minnesota Med.*, 1922, v, 697.

Bouman presents the history of a case in which a pancreatic cyst was successfully removed from a woman 27 years of age.

The typical case is that of an adult who has sustained a violent blow on the upper part of the abdomen causing signs of shock. After a variable period of time a globular and fluctuating tumor becomes apparent in the epigastrium. This is separated from the liver by a zone of tympany difficult to differentiate from splenic dullness. Insufflation of the stomach and X-ray examination are valuable aids in demonstrating that the growth is behind the stomach.

In many cases there is a history of loss of weight, increasing weakness, cardialgia, colics, disturbances of digestion and nutrition, and constipation. In addition there may be polyuria, glycosuria, or the presence of fat and undigested muscle fiber in the stool. In some cases the tumor may disappear or diminish in size and then grow again. As a rule the symptoms increase after the ingestion of food. The pancreatic cyst is the most painful of all the abdominal cysts. The use of the exploring needle in the diagnosis has been abandoned.

The ideal method of treatment is extirpation. When this seems impossible, marsupialization (the sewing of the cyst wall to the skin and drainage of its contents) may be tried. E. C. ROSTHERN, M.D.

Lombard, P., and Duboucher, H.: Encysted Hæmatomata of the Spleen (Les hématomes enkystés de la rate). *J. de chir.*, 1922, xx, 404.

In the spleen, non-parasitic cysts containing blood may be observed sometimes with a distinct wall and sometimes without. The first are true cysts which are extremely rare and of obscure pathogenesis. The second type appear to be encysted hæmatomata. The majority of the latter are due to traumatic rupture of the spleen, but a large number are formed by a spontaneous hæmorrhage not caused by external violence. The authors report a case of this type. The patient had a history of malaria and enlarged spleen since infancy, and the appearance of the cyst was preceded by a sudden renewal of the malarial infection. At operation an encysted hæmatoma was found. Macroscopic and microscopic examination showed that its contents consisted of pure blood in different stages of disintegration. On histologic examination it was found that the cyst wall lacked a cellular lining and was formed of connective tissue which was apparently the product of inflammatory reaction.

In 1910 Fowler collected eighty-six cases of non-parasitic cysts of the spleen, of which forty-one appeared to be of the second type described. The authors have discovered seventeen others, including

their own. The patient almost always gives a history of chronic malaria and only exceptionally mentions any other infection. Whatever the origin, a subcapsular or pericapsular collection may become encysted, rapidly increase, and rupture or become infected. The intense associated inflammatory reaction may extend and both the cyst and the spleen may become strongly fixed to the anterior and posterior abdominal walls and diaphragm by adhesions. The evolution of a blood cyst is always more rapid than that of a hydatid cyst.

When the spleen is adherent and fixed to the abdominal wall and diaphragm by old fibrous adhesions the difficulties are so great that splenectomy cannot be attempted.

In the case reported by the authors hæmostasis was obtained by ligation of the pedicle. The capsule was then incised, the pulp separated by burrowing beneath it with the finger, and the whole organ decorticated. There was no hæmorrhage. Postoperative bleeding was insignificant, tamponade being done only as a precaution.

The authors have been unable to find any report of previous use of this method of subcapsular or subserous decortication of the spleen.

W. A. Brennan.

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Ledderhose, G.: The Chronic Diseases of the Joints Other Than Mycotic and Neuropathic Conditions (Die chronischen Gelenkerkrankungen mit Ausschluss der mykotischen und neuropathischen Formen). *Ergebn. d. Chir. u. Orthop.*, 1922, xv, 204.

Chronic diseases of the joints are classified according to their clinical symptoms as arthritis deformans, chronic progressive polyarthritis, and chronic articular rheumatism.

One of the chief characteristics of arthritis deformans is its very insidious and slow course which permits a functional adjustment such as is not observed in any other similar condition. Arthritis deformans occurs more frequently in males than in females and usually develops at an advanced age. An important difference between this condition and other chronic joint diseases closely resembling it, such as primary progressive polyarthritis, is the fact that as a rule it attacks the larger joints, particularly the knee joint. It first causes motor disturbances in the joint, but as in the beginning these are not associated with pain they are often discovered only on physical examination. Joint crepitation is an early sign. Palpation reveals a swelling, an irregular surface, and, particularly, prominence of the edges of the joint, all of which become more noticeable with the advance of the disease. In contrast to tuberculosis and chronic progressive polyarthritis, the associated muscle atrophy in arthritis deformans is usually not very marked, and bone atrophy is either absent entirely or very slight. Friction on the primarily degenerated cartilaginous covering of the joint ends results in eburnation of the exposed bone and cartilaginous and bony proliferations at the cartilage bone borders. In many cases loose bodies are broken off.

With regard to the etiology of the condition Ledderhose states that if the theory that arthritis deformans is a general disease, is correct, the experimental injury of animal joints or static disturbances within human joints cannot produce this condition.

The analogy between arthritis deformans, gout, and joint diseases with alkaptonuria, and our knowledge regarding the etiology of chronic infectious and mycotic diseases of the joints make it appear to Ledderhose as exceedingly probable that in the final analysis the abnormal or abnormally behaving metabolic products—the expression of the arthritic predisposition—are responsible for the primary injury of the joint cartilage.

In the advanced stages of arthritis deformans of the shoulder joint the capsule is widened and destroyed. The long tendon of the external head of the biceps, which runs through the joint, is involved early, becoming stretched, displaced, or ruptured, changes which find their expression in the spherical form and the slipping downward of the external head of the biceps. Ledderhose has shown that the change in the shape of the muscle, which was formerly regarded as due to traumatic rupture of the biceps, is a sign of arthritis deformans.

The author discusses the effect of the disease also on other joints and its relation to injuries and inflammation of the palmar fascia (Dupuytren's contracture).

On the whole, the prognosis is unfavorable. Although there may be prolonged quiescence of the disease and improvement in the symptoms, the condition is progressive and incurable. In the chronic ankylosing disease of the vertebral column the shape of the vertebræ is a decisive sign in the differential diagnosis. In spondylitis deformans the vertebræ show marked changes, while the lateral articulations, which are the chief localization of the ankylosing disease, are seldom involved. Ankylosing spondylitis is not curable; therefore only symptomatic treatment comes up for consideration.

The other conditions discussed are osteochondritis deformans coxæ juvenilis, chronic progressive destructive polyarthritis, chronic articular rheumatism, chronic diseases of the joints occurring in infancy, and chronic diseases of the joints associated with alkaptonuria, psoriasis, or hæmophilia.

Valentin (Z).

Kappis, M.: Facts and Theories Explaining the "Spontaneous" Origin of Joint Mice (Tatsachen und Hypothesen in der Erklärung der "spontanen" Entstehung der Gelenkmäuse). *München. med. Wchnschr.*, 1922, lxix, 1158.

Axhausen's theory ascribing joint mice to mycotic emboli formed in the absence of infection but associated with obstruction of blood vessels and the production of bone necrosis has not been proved. Neither is there any foundation in fact for Rieger's theories of fat embolism, for Fromme's assumption that joint mice are due to small areas of disintegrating processes in the bone, or for Liek's theory of softening of the epiphysis due to disturbances of internal secretion.

Up to the present time only fracture has been proved a cause of the "spontaneous" origin of joint mice.

On the basis of a careful study of four cases the author concludes that a fracture may be the preliminary stage not only of "spontaneous" joint mice, but also of the earliest preliminary stages. He found that the fundamental basis of the preliminary stages need not be a necrosis of bone as believed by Axhausen or a necrosis of cartilage. Kappis therefore agrees with Barth that the condition is always due to a fracture although in some cases such an injury is not recognized. THOUP (Z)

Jacoby, P.: Scapular Crepitation (Crepitatio scapularis). *Ugesk. f. Læger*, 1922, lxxxiv, 1071.

Three grades of crepitation in the shoulder can be differentiated: the coarse, the medium fine, and the fine crackling. There is a difference also between pathological and physiological scapular crepitation. A high position of the sound or its limitation to one side is not a sign of the pathologic condition. Of 100 persons examined for scapular crepitation, twenty-three had this phenomenon in slight form. In seven (30 per cent) it was bilateral, while in eight it occurred on the right side and in eight on the left. Not one patient was aware of any disease or was inconvenienced by the crepitation.

The etiological factors are as follows:

1. Changes in the scapula or ribs, as in pathologic thickening of the upper angle of the scapula or exostoses, old fractures, and changes due to tuberculosis or syphilis.

2. Anomalies of the anterior serratus and subscapular muscles such, for example, as those due to atrophy.

3. Changes in the subscapular bursæ as, for example, those occurring in calcification and chronic bursitis.

4. Unexplainable causes.

5. Irritation such as occurs occasionally in athletes.

The pathological forms require treatment consisting of extirpation of the exostoses or bursæ or the chiselling off of deforming bony prominences. In some cases muscle and fat plastics may be necessary in addition. PEIPER (Z).

Mueller, W.: Observations on the Course, the End-Results, and the Familial Occurrence of Osteochondritis Deformans Coxæ Juvenalis (Beobachtungen zur Frage des Verlaufes, der Endausgänge sowie des familiären Auftretens der Osteochondritis deformans coxae juvenilis). *Arch. f. orthop. u. Unfall-Chir.*, 1922, xx, 347.

The author reports seven cases of osteochondritis deformans coxæ juvenilis, in six of which examinations were made for a period of eight years and in one at the end of fifty years. The latter case showed fungus-like changes in the head, widening of the acetabulum, and marginal proliferations. The patient was able to follow his calling of forester without difficulty. His daughter was afflicted with the same condition during her youth.

The subsequent examinations showed that in bilateral cases the foci of disease often appeared and healed at different times. In two cases in which the hips were involved there was complete healing, clinical as well as anatomical. The others showed the usual clinical course of the acute stage. The final result was an enormously enlarged, fungus-shaped femoral neck which, however, caused only very slight disturbance of function. SPITZY (Z).

Straehle, L.: Calvé-Legg-Perthes Disease of the Hip: Osteochondritis Deformans Coxæ Juvenalis (Malum coxae Calvé-Legg-Perthes. Osteochondritis deformans juvenilis coxae). *Finska läk.-sällsk. handl.*, 1922, lxiv, 244.

Straehle accepts Sundt's theory that the chief cause of the condition is a hereditary taint expressing itself in a disturbance of the function of the endocrine glands, chiefly the sexual and the parathyroid glands. Injuries are only exciting causes.

With regard to the pathogenesis he subscribes to the view of Perthes that the islands of cartilage occurring in the nucleus of the epiphysis and in the neck are the expression of a process analogous to the callus formation in fracture of bone.

The author's material includes five cases, those of four boys 7, 7, 8, and 13 years old respectively, and one girl 4 years old. The last two cases were under observation for only a short time. In the first three cases the roentgenograms showed spotty atrophy and thickening of the femoral neck. The change described by Sundt—diffuse calcium atrophy along the upper border of the neck—was noted in all of the cases. A distinct zone around the light spots was not observed. In the first and third cases the pain was localized in the knee joint exclusively, and in the second case developed first at the hip and later in the knee. In the first and second cases it was slight, but in the third case every motion in the upright position was at first difficult. No treatment was given. KOLTYNSKY (Z).

Saxl, A.: Late Rachitis of the Great Trochanter (Spätrachitis des grossen Trochanters). *Wien. klin. Wchnschr.*, 1921, xxxiv, 534.

Late rachitis of the great trochanter is characterized by rapid fatigue in walking, pain in

the hip and limping of gradual onset. Physical examination reveals circumscribed tenderness on pressure at the base of the trochanter. In the beginning of the disease complaint is made only of tension pains in the region of the adductors on maximal abduction. The later stages are characterized by limitation of abduction with spastic contracture of the adductors, moderate external rotation, and pain at the great trochanter on internal rotation. In the roentgenogram the epiphyseal cleft of the great trochanter is found widened and irregular (rachitis) or there is a clearing of the shadow in the region of the portions of bone adjacent to the epiphyseal line (osteomalacia).

The treatment is the usual treatment of rachitis.

The limping, limitation of abduction, and external rotation are due to the reduction of the tension energy of the gluteus medius and minimus muscles which, being attached to the painful greater trochanter, lose the ability to support the pelvis and to rotate the leg inward. MAU (Z).

Rieder, W.: Remarks on the Etiology of Schlatter's Disease (Zur Aetiologie der Schlatterschen Krankheit). *Arch. f. klin. Chir.*, 1922, cxx, 588.

Rieder has studied eight cases of so-called Schlatter's disease, incomplete avulsion of the epiphyseal process of the tuberosity of the tibia. The lesion is a thickening of the tuberosity of the tibia appearing on one or both sides during puberty.

There is still considerable difference of opinion regarding the etiology of the condition. On the basis of his studies Rieder concludes that the relationship between Schlatter's disease and late rachitis is by no means as close as Fromme believes. Rachitis was suggested by certain features in the bone marrow and the bones in only one case, and in this instance not very distinctly. In most of the cases the condition is of traumatic origin. Starvation osteomalacia or starvation osteoporosis may favor its development.

Rieder recommends extirpation of the torn-off piece of bone as the treatment of choice as it is the quickest and gives the best functional results.

VALENTIN (Z).

Feller, R.: Remarks on the Reports of Deutschlaender and Vogel on an Unusual Disease of the Metatarsus: Inflammation or Fracture? (Zu den Mitteilungen von Deutschlaender und Vogel ueber "Eine eigenartige Mittelfusserkrankung": Entzuendung oder Bruch?). *Zentralbl. f. Chir.*, 1922, xlix, 1410.

A woman 20 years of age noticed pain on lifting the foot after stepping on it. The condition developed suddenly without any external cause and persisted for two years. The roentgenogram revealed the findings reported by Deutschlaender. In about three months the pain disappeared just as suddenly as it had begun, but later again returned, the roentgenogram then showing marked periosteal proliferation of bone all around the metatarsus. The disease picture described by Deutschlaender was thus confirmed. In this case also there was a distinct fracture of the diaphysis of the metatarsus. The etiological factor was probably dancing and some other single injury. VALENTIN (Z).

FRACTURES AND DISLOCATIONS

Frisch, O.: The Treatment of Ununited Fractures of Bones (Die Behandlung ungeheilter Knochenbrueche). *Wien. med. Wchnschr.*, 1922, lxxii, 1061.

The author calls attention to the importance of the differential diagnosis between delayed callus formation and true pseudarthrosis.

The causes of pseudarthroses are given as large bone defects, especially those due to gunshot fractures; poor approximation; poor alinement; insufficient formation of callus; the interposition of soft parts or insufficient immobilization; and the appearance between the ends of the bone of some substance of unknown structure which interferes with the callus bridge.

Non-operative treatment consists of the application of a cast. Operative treatment consists of: (1) autoplasty, especially in cases of pseudarthroses of the lower extremities and large bone defects; (2) freshening of the wound, accurate approximation, and prolonged fixation of the ends of the bone. To secure absolute fixation the use of Lane's plates, bone or ivory pegs, or a wire suture is indicated. The author prefers Lane's plates because they have a stronger stimulating effect on the formation of callus. SPITZY (Z).

Pfanner, W.: The Operative Treatment of Supracondylar Fractures of the Humerus (Beitrag zur operativen Behandlung der suprakondylaeren Humerusfrakturen). *Deutsche Ztschr. f. Chir.*, 1922, clxxii, 211.

The author operated on a complicated supracondylar fracture of the humerus in a girl 9 years old. At the time of the operation, about six weeks after the accident, the infected wound had healed but there was a fistula leading to the humerus and the humerus was affected by osteomyelitis.

The fistula and cicatricial masses having been excised, the osteomyelitic bone was exposed up to the area where the callus developing from the lower fragment touched the stump of the humerus, and sectioned. At the same level the callus was chiselled through linearly and the freshened upper fragment placed over it. In this manner the callus developed from the elevated periosteum was used to replace the upper fragment of the humerus which had originally been rendered useless by the osteomyelitis and atrophy. Normal length and good apposition were obtained in spite of the resection of a piece 5 cm. long. Sparing of the lower epiphysis of the humerus was also possible. The good result as to mobility the author attributes to the fact that the correction was effected without opening the elbow.

HOHLFELD (Z).

Jaroschy, W.: Advances in the Treatment of the So-Called Typical Fracture of the Radius (Fortschritte in der Behandlung der sogenannten typischen Radiusfraktur). *Med. Klin.*, 1922, xviii, 1083.

As an improvement over the usual reposition and fixation of fractures of the radius in volar flexion and ulnar adduction the author recommends the method of reposition and fixation suggested by Zutinger, viz., right-angled flexion at the elbow, the middle position between pronation and supination, and slight dorsal flexion of the wrist. He emphasizes the fact that the best dressing is a dorsal plaster splint extending from the heads of the metacarpal bones almost to the elbow. Such a splint allows the patient to make a fist and to move the fingers. Ankylosis therefore can be prevented by movement of the fingers and turning motions of the wrist.

The author has used this method for a number of years and has found its results excellent.

SIMON (Z).

Stevens, J. H.: Compression Fractures of the Lower End of the Radius. *Ann. Surg.*, 1922, lxxvi, 599.

In most fractures of the lower end of the radius there is backward displacement of the lower fragment with crushing up of the cortical bone on the posterior side at the point of fracture. After the usual reduction the X-ray shows the plane of the inferior articular surface of the radius to be displaced posteriorly. Normally this plane forms an angle between 14 and 22 degrees with a plane erected at right angles to a line running straight through the shaft of the radius, and inclines anteriorly to allow full flexion of the wrist to a right angle.

Because of the destruction of the cortex of the bone on the posterior side at the point of fracture, complete reduction is usually impossible or not maintained because of the tension of the muscles. The lower fragment is drawn upward and backward, so that the plane of the inferior articular surface of the radius inclines backward instead of forward. A good functional result may be obtained but there will always be limitation of flexion at the wrist.

In the treatment recommended by the author for fractures of this type the inferior fragment is disimpacted by tension and hyperextension and reduced by local pressure over the fragment, traction, strong flexion of the wrist to a right angle, and adduction. A small piece of splint-wood, 2 in. square and well padded, is then placed over the anterior surface of the lower end of the upper fragment, with care to prevent pressure on the lower fragment, and another well-padded splint with a large opening to prevent pressure on the ulna is then applied to the posterior surface. When there is backward tilting of the lower fragment due to cortical bone crushing, the fracture is fully reduced and the ends are held in place by the application of a long posterior splint from the elbow to the finger tips which is bent at the wrist at an angle between 35 and 45 degrees in flexion and 30 degrees in adduction. In such cases the small anterior splint is applied above the lower fragment but over the lower part of the upper fragment. In cases of impaction too great for normal reduction the author uses a levering instrument which is shown in an illustration.

Movement is begun not later than the fourth day. With the anterior splint removed and the posterior splint left in position, the hand is moved gently in flexion and adduction. Extension is delayed until after eight days. After twelve or fourteen days the posterior splint is removed and a leather wrist strap applied.

FRANK G. MURPHY, M.D.

Delannoy, E.: Rare Wrist Injuries (Traumatismes rares du poignet). *Arch. franco-belges de chir.*, 1922, xxv, 826.

Delannoy describes three cases of rare injuries of the wrist: (1) fracture of the lower extremity of the radius and the ulnar styloid with fracture of the trapezius; (2) isolated fracture of the semilunar; (3) isolated fractures of the scaphoid and the pisiform.

In the first case the fracture of the trapezius was a crushing fracture.

The second case was diagnosed clinically as a fracture of the radial and ulnar epiphyses with a fracture of the scaphoid, but the X-ray showed these bones to be normal and clearly indicated the presence of a traction fracture of the semilunar bone.

In the third case the lesion could be identified only by means of a profile roentgenogram made at different angles.

W. A. BRENNAN.

Calot, F., and Colleu, H.: Congenital Subluxation of the Hip: Osteochondritis (or Coxa Plana) Is a Subluxation (De la subluxation congénitale de la hanche: l'ostéochondrite (ou coxa plana) est une subluxation). *Schweiz. Rundschau f. Med.*, 1922, xxii, 393.

The authors regard Legg's osteochondritis as a latent and unrecognized congenital subluxation and endeavor to prove this assumption correct by the anatomical, clinical, and roentgen findings. Displacements below the line from the antero-inferior iliac spine to the sciatic notch they designate as subluxations, but there are numerous variations between the true subluxation and the transitional forms to the normal. They show by pictures how the vertical diameter of the normal semicircular acetabulum may become greater and its transverse diameter smaller. In the roentgenogram, the normal acetabular arch shows a horizontal line and only one-fifth of it lies above the Y-ligament.

The authors distinguish two abnormal types of acetabulum: (1) the oblique type, in which the arch is high, the outer margin approaches the antero-inferior iliac spine, and the portion lying above the Y-ligament is much greater than in the normal acetabulum, and (2) the type in which the arch is not as high but shows indentation.

For these abnormal forms of the acetabulum there are two types of femoral head, the cap-shaped head and the fungus-shaped head, the former being found when the arch is high and the latter when the acetabulum is widened. The relation of the head of the femur to the acetabulum is disturbed either by lateral displacement or upward displacement. The X-ray examination must be made with the patient in the upright position. Even when upward dislocation due to widening of the epiphysis of the head is absent, the subluxation is evident from other signs such as indentation of the upper arch.

In some cases there may be no clinical signs at all, the condition being discovered accidentally in the roentgenogram. In others the signs are slight and indistinct, and become apparent only after a disturbance of muscular balance by disease, pregnancy, or obesity. Tuberculosis is excluded by the absence of atrophy and pain on pressure and by the fact that there is little disturbance of movement and the patient's general condition is good.

FRANK (Z).

Whitman, R.: Incomplete Epiphyseal Fractures at the Hip. *Ann. Surg.*, 1922, lxxvi, 624.

The neck of the femur is a weak point in the skeleton. Fracture of the femoral neck is frequent in advanced life because the general atrophy of old age renders the weak part less able to endure strain.

The author states that although previous treatises on fracture of the neck of the femur give the impression that the restoration of form and function should not even be sought, the abduction method of treatment he advocates in this article proves the error of this dictum.

Fractures of the neck of the femur may be divided into fractures of the neck proper and fractures at the epiphyseal juncture.

In childhood, fractures occur practically always in the neck and are often incomplete. The neck is forced downward and backward.

Epiphyseal fracture is uncommon in childhood because in early life the juncture is protected by a thick covering of cartilage. This type of fracture therefore occurs usually during adolescence when the cartilage is becoming thinner as the area of ossification advances. In most cases the fracture is incomplete, suggesting a progressive deformity. A certain percentage of persons with such fractures are fat, presenting a picture of endocrine disturbance. The exciting cause of the fracture is apparently a superficial fracture at the upper portion of the juncture or a less direct injury which weakens the immature bony structure on the diaphyseal side of the cartilage. Gradual downward and backward displacement follows. Under conditions favorable for repair, further deformity may be checked. In other cases the weakened juncture may give way completely, causing sudden lameness.

The usual history is one of a beginning limp, occasional stiffness and discomfort at the hip or knee, and pain after exertion. The injury may be overlooked. In some cases practical disability may result before the patient comes under observation.

Outward rotation of the limb is persistent. The weight is borne on the whole foot, not on the toes alone. Actual shortening is present. Passive motions are restricted in flexion, abduction, and inward rotation. Extension is increased in range.

In the X-ray picture the head and neck of the femur form an unbroken line and there is no demarcation between them as in the normal hip. The epiphysis, as compared with its fellow, is shallow and the juncture seems wider. Actual separation may be noted at the upper border of the cartilage.

The treatment consists in restoring the normal range of motion. Abduction is indicated primarily to utilize the natural leverage. Under anæsthesia, with the pelvis fixed by abduction of the sound limb, the limb of the injured side is abducted as far as possible. At this point the upper rim of the acetabulum acts as a fulcrum. Since the capsule is tense, further abduction forces the neck into its normal relation with the head.

When displacement is too great or consolidation too advanced, open reduction is necessary. The neck is exposed by an anterolateral incision. From the extremity of the head a thin section of bone is removed to permit insertion of the chisel between the two fragments. The head is replaced by rotation of the limb and leverage on the chisel.

From the therapeutic standpoint cases may be divided into three classes: (1) those in which the deformity is slight and fixation in abduction will give good function, (2) those in which forcible manipulation is indicated to correct the deformity, and (3) those in which operation is necessary.

After the restriction of abduction and inward rotation has been overcome, the limb is fixed by a long plaster spica in complete abduction and inward rotation for three months, or long enough to permit consolidation.

The author suggests the same method of abduction for Legg-Perthes disease.

Cases of coxa vara are confused in orthopedic literature. The author would limit the term "coxa vara" to a depression of the neck of the femur as a whole in relation to the shaft. In the typical form of coxa vara the head is rarely depressed in its relation to the neck.

Bilateral coxa vara in adolescence is a further development of a pre-existing deformity of childhood. Bilateral epiphyseal deformity, distinct from coxa vara, occurs in persons showing signs of endocrine disturbance. JOHN MITCHELL, M.D.

Wilensky, A. O.: Immediate Operation for Fracture of the Neck of the Femur. *Ann. Surg.*, 1922, lxxvi, 631.

The author states that the use of the Whitman abduction method for the treatment of transcervical and subcapital fractures of the femur is invariably followed by non-union in the cases of old persons

and gives good results in only about 15 per cent of persons of middle age. In the latter group this method may be tried first and open operation performed later if the results are unsuccessful, but such a procedure is associated with a loss of several months of time and shortening of the limb. In a case thus treated the leg was adducted and shortened and pain persisted after the open operation performed by the author. This case is contrasted with another treated by immediate operation which Wilensky regards as the method of choice.

In the immediate operation an 8-in. incision is made over the great trochanter and traction is applied to the limb by means of the Hawley table. A hole is then drilled from the base of the trochanter through the neck and into the head, and an autogenous bone peg taken by chisel and mallet from the outer aspect of the femur presenting in the wound is driven in and chiseled flush. A plaster bandage is then applied with the limb in abduction and left in place for two months. During the third month, massage and passive motion are instituted with the patient in bed. During the fourth and fifth months the patient is allowed to walk with the aid of a splint. At the end of six months all support is removed.

In the case reported excellent anatomical and functional results were obtained with no shortening and practically full motion.

D. R. Telson, M.D.

Painter, C. F.: Injuries to the Crucial Ligaments and Avulsion of the Tibial Spine. *Boston M. & S. J.*, 1922, clxxxvii, 765.

In the author's opinion rupture of the crucial ligaments is not as serious as was formerly believed as very good function may be expected after injuries of this nature and the operative treatment is associated with very little risk. In the majority of cases the conditions call for tunneling operations and transference of muscles or transplants of fascia. The crucial ligaments may be repaired or bridged through a median incision in the patella. Protection with a cage splint for several months after walking is begun should be insisted upon.

Avulsion of the tibial spines should be treated conservatively by the application of a cast with the leg in extension.

The comparatively good function which frequently follows rupture of the crucial ligaments is explained by the fact that as a rule the contour of the articular surfaces of the femur and tibia is not changed.

When a person with arthritis lies in bed for a long time with his legs in slight flexion or complete extension the condyles become spared and the tibia subluxated to such an extent that he is completely incapacitated even before the cartilage has become eroded or the capsule or ligaments greatly changed. If such osseous distortion can be prevented the prognosis as regards function in the knee joint is very favorable.

Philip Lewin, M.D.

Moore, B. H.: Subastragaloid Dislocation of the Foot. *Surg., Gynec. & Obst.*, 1922, xxxv, 755.

Subastragaloid dislocation of the foot, in which the os calcis and the scaphoid are displaced from the astragalus, is a rare injury. Its causes are usually a fall from a height in which the weight of the body is received on the adducted or abducted foot, or a violent blow on either side of the lower part of the leg. The dislocation may be inward, outward, backward, or forward. When it is outward, the astragalus sinks down as the result of weight-bearing, the foot becomes everted and abducted, and the head of the astragalus becomes prominent on the inner side. When the dislocation is outward, the interosseous ligament is ruptured between the astragalus and the os calcis, and the astragalocalcaneal ligament and a portion of the deltoid ligament are torn.

The treatment consists in primary reduction when possible, the method depending upon the type of the dislocation and being based on the principle of reversal of the force which caused the dislocation. For old dislocations in which reduction is impossible astragalectomy is the method of choice.

Frank G. Murphy, M.D.

Muelleder, A.: A Case of Breaking-Off of the Tuber Calcanei (Ueber einen Fall von Abbruch des Tuber calcanei). *Wien. klin. Wchnschr.*, 1922, xxxv, 656.

The author reports a case of avulsion fracture of the tuberosity of the os calcis in which there was dislocation in the longitudinal axis with distortion and rotation of the proximal fragment about 90 degrees. The broken-off fragment was immediately replaced by open operation as perforation of the skin threatened. It was possible to approximate the bones by marked plantar flexion and to fix them with strong silk sutures (plantar fascia to the periosteum and the insertion of the Achilles tendon). A plaster cast was applied in the pointed-toe position.

The wound healed by primary intention and the roentgenogram showed good callous union. The after-treatment included active and passive motion, baths, and massage. Function was almost normal, but prolonged walking caused great fatigue and pain. The patient could not follow his calling (carpenter) completely after five months. Such injuries often produce long continued disturbances.

These fractures may be due to indirect causes (such as tension of the musculature of the calf and falling on the foot in the position of marked plantar flexion) and to the direct effect of force against the tuberosity of the os calcis. Zur Verth does not recognize avulsion fractures in this region but speaks of compression fractures with or without destruction of the framework of the foot (the investigations of Tietze and Heiligtag showed that the Achilles tendon is not inserted at the upper, posterior border of the os calcis). During the World War Zur Verth observed fractures of the tuberosity of the os

calcis due to a force from below rather than to contracture of the Achilles tendon. He claims that there is also a longitudinal compression as the tuberosity is released from ligaments under tension.

The author believes that in his own cases direct force was responsible, the foot being wedged and the body sinking to one side so that the fragment was twisted.

The treatment is usually conservative, consisting of the application of a plaster cast with the foot in plantar flexion and the knee bent. The author recommends tenotomy to eliminate the tension of the muscles and to avoid the long continued pointed-foot fixation otherwise necessary. ZIPPER (Z).

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Henderson, M. S.: Surgery in Infantile Paralysis. *Minnesota Med.*, 1922, v, 706.

After passing briefly over the treatment of infantile paralysis in the acute stage and the period of recovery, the author discusses the various operations of value in the stage of residual paralysis. During the period of recovery there may be deformities due to improper muscle balance after partial paralysis and the deforming action of gravity which proper splinting would have prevented.

Emphasis is placed on the proper selection of cases for surgery. The case should be studied as a whole, and special attention should be paid to the gait. The patient or his parents should have a clear understanding of just what is and what is not to be expected from a certain operation. Of 1,774 cases treated conservatively at the Mayo Clinic, 25 per cent were subjected to surgery.

Manipulation, tenotomy, osteotomy, arthrodesis, tendon plastics, tenodesis, and astragalectomy are considered in turn. In the contractures of deltoid paralysis, mild hip or knee flexion, and mild equinovarus much can be accomplished by manipulation alone, either by the daily application of moderate force, the position gained being held by a suitable splint, or by forcible correction under anæsthesia. In straightening the knee care must be taken to prevent subluxation. Tenotomy is indicated only when nothing further can be accomplished by manipulation. In talipes equinovarus, if the tendon of Achilles is cut before manipulation, the fulcrum action is lost, and it is difficult to correct the varus. Frequently, section of the plantar fascia is necessary.

Osteotomy is next considered. In cases of deformed feet after manipulation and tenotomy, osteotomy through the tarsal bones is often necessary. In a characteristic deformity of a flail lower extremity with some power in the hamstrings and extensor fasciæ femoris, the thigh is flexed and abducted and the knee is flexed and possibly subluxated with outward rotation of the leg below the knee. After the hip and knee have been straightened, there is often a knock-knee and an everted foot, the latter due to the rotated tibia. An osteotomy through the lower end of the femur and another through the upper third of the tibia, and possibly the fibula, may be necessary to correct the two deformities. Correcting the line of weight-bearing restores function in a surprising manner, for weak muscles are placed by the correction in a more favorable position for work. It is well known that a limb without paralysis tires very easily when the weight-bearing line is faulty.

Arthrodesis should be used to increase function and give stability to the lower extremity and to increase function in the upper extremity. Arthrodesis in the lower extremity should be used only when the extremity below the joint to be fixed is capable of being made to bear weight or, in other words, when the fixed joint can be used to advantage. Some persons may prefer to use a brace rather than to have a stiff knee. Astragalectomy is usually preferable to arthrodesis in the ankle joint. As all lateral mobility occurs below the astragalus, astragalocalcaneal arthrodesis is sometimes of value in stabilizing the foot. Astragaloscaphoid arthrodesis may be used to overcome a tendency to eversion in the forepart of the foot. Arthrodesis is of value in the shoulder joint only when the scapular muscles are intact, even when the elbow cannot be voluntarily moved, for when the arm is raised from the side, gravity will bring the hand to the head. If the hand is paralyzed, arthrodesis is contra-indicated. The elbow may be ankylosed in the position of election, but the patients get along so well as they are that they do not often choose arthrodesis.

Better results than heretofore are now being obtained in tendon plastics because of better selection of the cases and better understanding of the limitations of operations on the tendons. In the foot of a patient with a paralyzed tibialis anticus and strong peroneals, one of the peroneals may be transferred to the tibialis anticus. If the peroneal group is paralyzed and the tibialis anticus is strong, the tibialis anticus may be transferred to the cuboid bone on the outer side of the foot. Transfer of the peroneals to the tendon of Achilles for talipes calcaneus and transfer of the extensor longus hallucis to the front part of the foot for toe-drop have been disappointing in the author's experience. Failure is certain if a weak muscle is transferred to replace a strong one. Transfer of the biceps femoris or occasionally the semitendinosus to the patella when the quadriceps extensor is paralyzed is very satisfactory as it gives stability to the knee even though the patient is not able to extend the knee fully. Opportunity for tendon transference in the upper extremity is rare, at least in infantile paralysis.

By tenodesis it is possible to prevent foot-drop by fixing the distal parts of the paralyzed extensors of the toes and the tibialis anticus into the tibia. It is possible also to prevent calcaneal deformity by implanting the tendon of Achilles into the tibia. The use of tenodesis has been disappointing in the

author's experience because the tendons have so often slipped at the new insertion to the bone.

Astragalectomy with posterior displacement of the foot is indicated chiefly in calcaneovalgus, but may be used to advantage in flail feet. The most important points of the operation are backward displacement of the foot and the maintenance of valgus with slight equinus.

Reid, M. R.: The Use of Large Reverdin Grafts in the Healing of Chronic Osteomyelitis. *Bull. Johns Hopkins Hosp.*, 1922, xxxiii, 380.

The treatment of chronic osteomyelitis is based upon the obliteration of the bone cavity. Reid introduces a new method, the use of so-called "pinch grafts." The technique is as follows:

The bone cavity is treated with Dakin's solution until it becomes lined with clean, firm granulations. Without the use of this or some other antiseptic solution, the granulation tissue will become œdematous, forming an unhealthy base for the growth of the grafts. Two hours after the last irrigation with the Dakin solution, large, thick pinch grafts 1½ cm. in diameter are placed closely together upon the surface of the cavity. The grafted wound is then exposed to the air from six to eight hours. This period of drying serves to fix the grafts firmly into the granulation tissue. The grafts are then covered and held in place with a single layer of gauze firmly fixed to the skin.

During the next two days saline compresses are applied. Dakin's solution is then used instead of the salt solution for five days, being applied by laying wet compresses directly against the wound every two hours during the day and every four hours at night. At the end of this time the wound is dressed with protective rubber or old linen.

The grafts grow quickly and cover the granulation tissue with epithelium in from ten days to two weeks. If the granulations become high, Dakin's solution is re-applied for one or two days to reduce the swelling. Caustics should not be used.

The technique described is of value especially for the closure of large bone cavities which are difficult to obliterate by other methods. The epithelial covering formed by pinch grafts is thicker and more durable than that formed by Thiersch grafts and therefore will better withstand the action of the moisture present in deep cavities.

S. C. Woldenberg, M.D.

Campbell, W. C.: Arthroplasty of the Elbow. *Ann. Surg.*, 1922, lxxvi, 615.

Cases for elbow arthroplasty must be chosen judiciously.

The following pathologic conditions mentioned by the author decrease the chances of success or contra-indicate surgical interference: (1) tuberculosis, (2) osteitis with much shortening of the extremity, (3) extensive scars binding the skin to the bone, (4) extreme muscular atrophy with reorganization of bone structure as when, after a long time, the medulla of the humerus and ulna become continuous, and (5) old ebumrated bone extending a considerable distance on each side of the joint.

Two conditions alone justify arthroplasty, viz., fracture with ankylosis following traumatism, and ankylosis following infection.

There are five methods of arthroplasty, viz.:

1. Wide excision of the articular surfaces. Usually an unstable joint results.

2. The interposition of pedunculated fascial flaps between the remodeled articular surfaces. This method has been abandoned.

3. The interposition of animal membranes. The disadvantage of this procedure is infection favored by foreign-body irritation.

4. Free fascia lata transplantation.

5. Mechanical reconstruction of the surfaces of the joint and the interposition of various substances.

The author makes a 6- to 8-in. incision on the posterior aspect of the arm and forearm, just external to the midline, beginning about the middle of the humerus and extending about 2 to 3 in. below the elbow joint. Skin, superficial fascia, and deep fascia are incised and separated. In this manner the aponeurosis of the triceps is exposed. This structure is dissected from above downward, making a long tongue attached to the olecranon below. The incision is continued through the muscular fibers of the triceps and the periosteum over the lower half, and the periosteum then stripped from the lower end of the humerus. Scar tissue, callus, and loose bony particles are removed.

About ½ in. is removed from the lower end of the humerus, and the cut end is remodeled into a surface convex from before backward. No attempt is made to reproduce the normal anatomy of the bone. About ½ in. is cut from the tip of the olecranon process. The bone is removed until healthy spongy bone is exposed.

The radio-ulnar joint is not disturbed, but the surface of the radial head must be on the same level as the coronoid process. The periosteum and triceps muscle are dissected into a double flap which is stitched to the anterior capsule and serves to separate the raw bony surfaces. When the radiohumeral joint is normal and there is bony ankylosis between the ulna and humerus, the radiohumeral joint is not destroyed, a hemi-arthroplasty being done between the humerus and ulna. When in such cases it is impossible to obtain a posterior flap of sufficient size, the aponeurotic tongue from the triceps is placed between the surfaces. The capsule of the joint is stitched to the posterior aspect of the triceps and deep fascia.

In one case full flexion and extension have been secured with no motion in the radio-ulnar joint.

The after-treatment is important, and there must be co-operation between the surgeon and physiotherapeutist. Active motion is essential.

John Mitchell, M.D.

Roberts, P. W.: A New Approach to the Semilunar Cartilages. *J. Am. M. Ass.*, 1922, lxxix, 1608.

The new approach described by the author eliminates strain on the wound when the knee joint is flexed and obviates suturing of the synovial membrane.

A blunt V-shaped incision is made, one arm of which begins about ¾ in. above the upper border of the tibial condyle and follows down the border of the patellar ligament for a distance of 1½ in. The knife is then carried transversely outward a short distance and then upward inside the lateral ligament to the level of the opposite arm. This incision is made through all tissues overlying the tibia, including the periosteum. With a periosteal elevator the flap is separated and retracted upward until the coronary ligament is exposed. The coronary ligament is incised transversely at its attachment to the tibia. On further retraction the meniscus is exposed and may be dissected out with a narrow-bladed knife. The periosteum and overlying tissues are then replaced and sutured in position with interrupted chromic gut sutures not including the synovial membrane. The skin is closed with silk. The firm suturing of the periosteum prevents strain on the knee wound even when the knee is flexed at 90 degrees.

FRANK G. MURPHY, M.D.

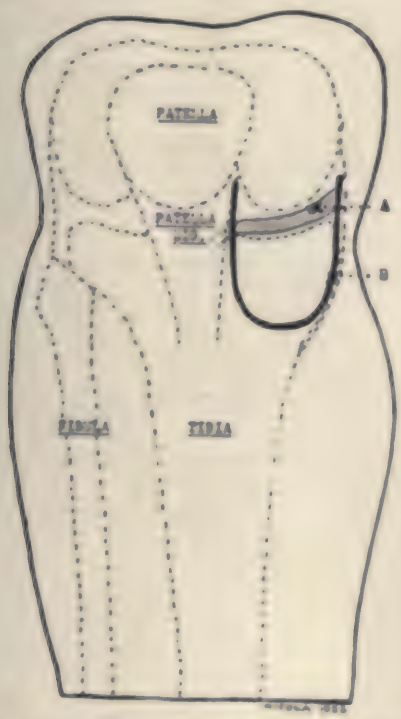


Fig. 1. Line of incision for excision of internal semilunar cartilage. A, internal semilunar cartilage; B, line of incision.[1] (*Roberts*)

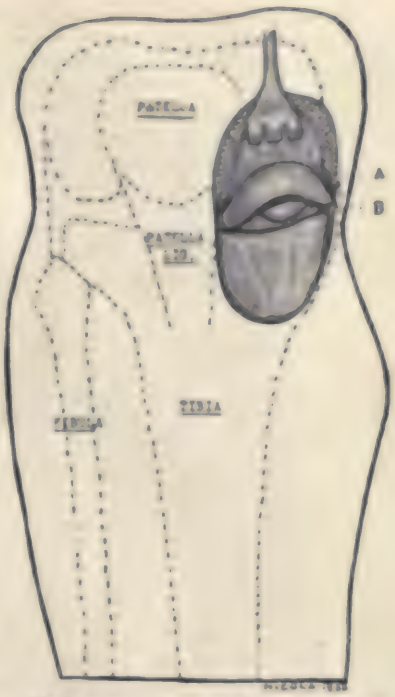


Fig. 2. Flap retracted upward, showing exposure of meniscus on its under surface. A, internal semilunar cartilage; B, medial condyle of femur.[1] (*Roberts*)

Mondor, H.: Wounds of the Knee (Les plaies du genou). *Presse méd.*, Par., 1922, xxx, 961.

Mondor reviews the treatment of wounds of the knee during the World War. Arthrotomy for drainage was the method in general use in the beginning but was abandoned because of its disastrous results. In the treatment then adopted the joint was opened wide, cleansed of all débris, closed by primary suture, and treated by active mobilization.

In the war of 1870 the immediate mortality of knee wounds in the French army under a policy of surgical abstention was between 40 and 50 per cent, while in the German army, in which immediate resection was done, it was 80 per cent. In a series of 208 cases treated by arthrotomy for drainage during the World War there were fifty-two deaths, thirteen secondary resections, and forty-one subsequent amputations in addition to numerous instances in which ankylosis resulted, while in 328 cases treated by mechanical cleansing of the joint followed by primary suture there were 312 recoveries without ankylosis.

W. A. BRENNAN.

Liniger: The "Gritti" Amputation in Insurance Medicine (Der "Gritti" in der Versicherungsmedizin). *Arch. f. orthop. u. Unfall-Chir.*, 1922, xx, 419.

Liniger considers the results of the Gritti technique as unfavorable from the standpoint of industrial

[1] Illustration by courtesy Journal of the American Medical Association.

medicine. In his twenty-five cases of accident injuries full weight-bearing capacity was present in only eight, no weight at all could be borne on the stump in thirteen, and only partial weight-bearing was possible in four. The patella was in proper position in twenty cases, and displaced without impairment of the weight-bearing capacity in five. Shortening of the thigh amounting to 4 or 5 cm. and atrophy of the musculature up to a minimum circumference of 10 cm. at the middle were other sequelæ. The permanent compensation averaged 60 per cent. Four patients were fully able to earn their living, seventeen were partially incapacitated, and five were unable to work. In 40 per cent of the cases a high amputation of the leg would have been sufficient. Very often difficulty is experienced with the artificial leg. The Gritti stump is not favored by manufacturers of appliances because it requires a special construction of the weight-bearing surface.

On the basis of his twenty-five cases the author comes to the conclusion that the Gritti amputation has no marked advantages over a low amputation of the thigh. SCHLESS (Z).

SURGERY OF THE SPINAL COLUMN AND CORD

Schede, F.: Puncture of the Prevertebral Abscess (Die Punktion des praevertebralen Abscesses). *Muenchen. med. Wchnschr.*, 1922, lxix, 779.

It must be assumed that the paralysis in spondylitis is caused less by collapse of the vertebræ than by the pressure of the prevertebral abscess. If the prevertebral abscess is to be punctured from the rear, the surgeon must determine its depth in order that he may know how deep to insert the needle. Staub's procedure, described in detail in this article, makes it possible to determine the depth of the abcess by the aid of the X-ray.

Pus can be successfully evacuated only if the burrowing of the abscess has not proceeded too far. When the pus has once made its way downward, the prevertebral abscess does not fill again and only its walls remain visible in the roentgenogram. Hence, puncture is less suitable for abscesses of the lumbar spine than for those of the dorsal spine, since the latter usually burrow later.

The author warns against the use of Calot's solution after puncture of a spondylitic abscess. On account of the rapid diffusion of the creosote-ether contained in the solution, one of his patients suffered an immediate slight shock with coughing and the expectoration of sputum tasting strongly of creosote.

The effect of the relief of the pressure on the medulla is usually noted very soon after the puncture.

Puncture of a prevertebral abscess is to be looked upon as a safe and very effective method much to be preferred to costotransversectomy since it almost entirely excludes the possibility of secondary infection. FELIX THIESSEN (Z).

Kron and Mintz: Cervical Ribs (Ueber Halsrippen). *Deutsche med. Wchnschr.*, 1922, xlviii, 975.

A woman, 33 years old, complained of pain in the right arm which occasionally, particularly in cold weather, became more severe and radiated into the occiput. These attacks were characterized also by a waxy pale discoloration of the right fingers and a bluish discoloration of the tip of the right index finger.

Careful examination revealed a distinct widening of the subclavian artery in the supraclavicular fossa and rapid pulsation and a thrill under the superimposed finger. When the artery was displaced, a hard resistance was noted. The ulnar pulse was weak and the radial pulse absent. The roentgenogram revealed the presence of a cervical rib impinging upon the first thoracic rib. The patient delayed surgical treatment for two months.

At operation the subclavian artery was exposed by a Kocher incision. Since the time of the first examination it had become thrombosed. The rib was removed first in the direction of the vertebræ and then in the direction of the chest, with care not to injure the brachial plexus, the transverse cervical artery, or the scapular artery. The resulting hole in the dome of the pleura was covered by suturing tissue over it. A complete cure had not been obtained at the end of five months but the clavian artery showed pulsation.

Three other cases of cervical rib are reported in brief. The literature on the subject is reviewed and reference is made to Streissler's operation which is begun at the nape of the neck. PLENZ (Z).

Openshaw, T. H.: Traumatic Spondylitis. *Proc. Roy. Soc. Med.*, Lond., 1922, xvi, Sect. Orthop., 1.

The author reports fourteen cases of traumatic spondylitis or fracture dislocation of the spine. In three cases the cervical vertebræ were involved, in six the dorsal vertebræ, and in five the lumbar vertebræ. In one case with entire loss of motion in the neck and marked wasting of the muscles of the forearm and shoulder, partial reduction of the dislocated vertebræ under anæsthesia was followed several days later by loss of power in the other arm. This complication was transient, however, and the patient ultimately made a complete recovery.

Another case reported was that of a woman whose right arm became painful and weak following dislocation of the fifth cervical vertebra by a fall. Openshaw made an incision over the median line of the neck and wired the two laminæ together. Power in the right arm steadily returned. Removal of the wire after four months was followed by recurrence of the weakness.

Openshaw states that in fracture dislocation of the dorsal and lumbar spine the most important

sign is hyperæsthesia of the intercostal nerves, the so-called "girdle pain," or pain along the course of the lumbar or sciatic nerves. This sign is of value because it indicates which of the intercostal nerves corresponds to the site of the fracture dislocation. A stereoscopic examination is also of great aid in the diagnosis.

The X-ray will show: (1) anterior and lateral compression of the body of the vertebræ, (2) wedge formation of the vertebræ, (3) obliquity of the surfaces, (4) irregularity of adjacent surfaces of two vertebræ, (5) gaping of the anterior part of the intervertebral spaces, (6) lipping of the anterior edges of the upper and lower surfaces, (7) central absorption of the vertebral bodies, (8) separation of the ribs due to kyphosis, (9) angular curvature, (10) ankylosis and synostosis, (11) lateral deviation, and (12) rupture of the supraspinatous and interspinous ligaments.

For cases of traumatic spondylitis in the cervical region the author recommends manipulation to force the vertebræ into place, the temporary application of a leather or felt collar or plaster of Paris, and wiring of the laminæ, the wire being left in.

Cases in which the dorsal vertebræ are affected should be treated by recumbency if the condition is serious, by the application of a leather corset with arm supports, and by wiring if the kyphosis tends to increase.

When the lumbar region is the site of the lesion Openshaw applies a leather corset and laces the spinous processes together with silver wire.

Suppuration is rare unless there is an open suppurating wound elsewhere. The pain decreases quickly in severity and extent after the spine is immobilized. The cure is slow, requiring eighteen to thirty months.

The article is illustrated with seven roentgenograms. S. C. Woldenberg, M.D.

Schrøder, G. E.: Rhizomelic Spondylosis: Spondylitis Deformans (Spondylose rhizomelique: spondylitis deformans). *Ugesk. f. Læger*, 1921, lxxxiii, 951.

In eighteen of twenty-five autopsies on very young persons exostoses suggestive of arthritis deformans were found although there had been no nervous symptoms during life.

One of the two cases reported, that of a man 42 years old, the author designates as a case of rhizomelic spondylosis with typical complete ankylosis of the spinal column, kyphosis of the cervical and upper thoracic spine, obliteration of the lumbar curvature, and slight muscular atrophy. The X-ray revealed narrowing of the intervertebral discs and fusion of the bodies of the vertebræ. The noteworthy features in the history were gonorrhœa and syphilis. Otherwise the course of the disease was the usual one, beginning with pain in the spinal column and ending with rigidity. The author leaves open the question of the etiology but is inclined toward the view that the gonorrhœal infection may have been an exciting factor.

The second case, that of a 35-year-old man, the author designates as a case of arthritis deformans. This began with pain in the vertebral column and the extremities and ended with rigidity of the spinal column in a markedly stooping position and muscular atrophy. The X-ray showed excrescences around the vertebral bodies which finally spread from one vertebra to another in the form of bony bridges. The author believes the diagnosis should be based on the X-ray findings. Spitzy (Z).

Cofield, R. B.: Bony Bridging in Tuberculosis of the Spine. *J. Am. M. Ass.*, 1922, lxxix, 1391.

The presence in the spine of hypertrophic changes associated with bony bridging and ankylosis of the vertebræ has been regarded since the advent of roentgenology as evidence of the strictly non-tuberculous nature of the disease. This theory the author believes is incorrect. Since it is known that mixed infections due to external drainage of cold abscesses often give rise to bridging, he regards it as not improbable that such bridging may result also from secondary infection of the tuberculous process carried by the blood stream from some septic focus in the body.

The localization of the chronic low-grade infection in the superficial portion of the vertebra in juxtaposition to the osteogenetic periosteum may be responsible for the laying down of bone, the same process in the center of the vertebra having no such action. The regional location of the vertebra in the spinal column is also a factor since, as a rule, the spurs are found in the lumbar region where the reaction to the strain of weight-bearing is greatest. Although usually tuberculosis does not produce bone, the reaction to any infection varies with the situation of the process, and the spinal articulations are more apt to react to infection by ankylosis than any other joints in the body. D. R. Telson, M.D.

Kleinberg, S.: The Operative Treatment of Scoliosis. *Arch. Surg.*, 1922, v, 631.

A complete cure of structural scoliosis cannot be obtained by any known method. Treatment is directed toward reducing the curvature, improving the appearance of the back, and maintaining the improvement.

Both Hibbs and Forbes advocate a fusion operation to obtain osseous union of the posterior arches of from eight to twelve vertebræ.

The author employs the Hibbs fusion operation and a graft of beef bone.

Before the operation the patient is placed on a convex frame, the highest point of which is under the middorsal region. Traction is applied to the head by means of a Sayre halter, and to the trunk by a pelvic belt with weights suspended from cords over pulleys at the foot of the bed. Weight is not applied until the position is no longer irksome. It is then applied gradually. The head weight varies from 5 to 10 lbs., and the pelvic weights are a little heavier. If there is much anteroposterior or lateral deformity

a Balkan frame is used and forward or lateral traction is applied. Traction is continuous except at meal times, during the bath, and during massage. The patient is ready for operation when the maximum degree of correction is obtained. A greater degree of improvement is obtained in four to eight weeks by this method than can be obtained in more than six months by means of corrective plaster-of-Paris jackets.

The preparation for the operation is important. A beef-bone graft cut to the shape and size desired is boiled for several hours, placed in a closed container with ether, and just before the operation boiled again for half an hour. Transverse nicks are then cut in it to favor vascularization. Three days before the operation, traction and massage are discontinued, the back is thoroughly scrubbed, and a sterile dressing is applied. On the second day the same procedure is repeated. On the morning of the third day the back is painted with one-half strength tincture of iodine and another sterile dressing is applied. If the operation is to be performed in the morning the iodine is applied the night before.

The author's operation combines the technique of Hibbs and Albee. Most of the vertebræ of a simple curve and all the vertebræ of the dorsal segment of a compound curve are included.

In making the skin incision the knife is carried through to the muscles. The arches of muscles and periosteum are laid bare with a periosteal elevator laterally to the tips of the transverse processes, and the joints of the articular processes are scarified or destroyed. Chips of bone are removed from the laminæ and placed across the interlaminar spaces. The spinous processes are split and turned down so that the tip of the process above fits into the space at the base of the spinous process below. The spinous processes of the two vertebræ at the upper limit of the curve and of two below the lower limit are split. A graft long enough to cover the vertebræ operated on, about 6 mm. wide, somewhat less than 6 mm. in thickness, and with a curve corresponding to the spinal curve, is laid in the wound upon the laminæ and transverse processes on the concave side of the curve and its ends are embedded between the split segments of the transverse processes. The periosteum and muscles are sewed with interrupted kangaroo sutures, and the subcutaneous tissue and skin with catgut. A warm sterile flannel jacket is applied over the sterile dressings.

In a week or ten days, when the patient has recovered from the immediate effects of the operation, he is replaced on the frame, traction is applied, and massage and exercise of the limbs are begun. At the end of eight weeks he is usually able to stand up. A light, well-fitting plaster jacket is then worn for several months.

The entire course of treatment requires from six to nine months.

The immediate results obtained by the author have been satisfactory, but the time which has elapsed is not sufficient to warrant conclusions as to the end-results. JOHN MITCHELL, M.D.

Hackenbroch, M.: The Casuistics, Pathology, and Treatment of Spina Bifida Occulta and Its Sequelæ (Zur Kasuistik, Pathologie und Therapie der Spina bifida occulta und ihrer Folgezustände). *Muenchen. med. Wchnschr.*, 1922, lxix, 1191.

The case reported was that of a girl 12 years old who had had an increasing deformity of both feet since her third year and nocturnal enuresis since earliest infancy. Examination revealed talipes cavus with hyperextension of the toes of both feet. On passive dorsal flexion a distinct spastic resistance was felt. The skin of the feet was livid and cold. At the level of the last lumbar vertebra was a swelling 7 cm. long and 4 cm. wide which raised the skin about 1.5 cm. This tumor was elastic and the skin over it was movable. The roentgenogram showed a cleft in the arches of the third, fourth, and fifth lumbar and the first, second, and third sacral vertebræ.

At operation a curved incision was made with its base downward. The tumor appeared to consist of normal muscle tissue embedded in the fascia. When the vertebral canal was opened the dura was found adherent to the posterior aspect of the vertebral arches by firm, fibrous bands, some of which were 1 cm. thick. The bands were separated and excised. Careful separation of the muscle mass from the substratum revealed a sort of spinous process on both sides which was attached in the center by a firm and apparently bony tissue forming the substratum of the muscle mass. Following resection of this formation a lipoma about the size of a cherry was found adherent to the dura and vertebræ.

One hour after the operation the feet were warm and their color was normal. The operation cured the enuresis also. A month later the deformity of the feet was corrected surgically. PORT (Z).

SURGERY OF THE NERVOUS SYSTEM

Langemak, O.: Technique of Nerve Suture (Zur Technik der Nervennaht). *Zentralbl. f. Chir.*, 1922, xlix, 1153.

Following excision of the neuroma, the two nerve stumps, through which silk threads have been drawn, are introduced into a calf artery and brought as close together as possible by drawing on the threads. Before the threads are cut and withdrawn, the ends of the artery are fastened to the nerves on both sides by fine silk sutures. The nerves are joined through an opening in the middle of the artery.

If the space between the ends of the nerve is so great that, despite stretching, the ends cannot be joined, the artery is left unopened or the opening is stitched with catgut and the skin wound closed. After successful stretching by changing the position

of the joint the artery is again exposed and opened and the nerve sutured. Subsequently the artery is removed. TRAUB (Z).

Bruening, F., and Stuhl, O.: The Physiological Effect of Extirpation of the Peri-Arterial Sympathetic Nerve Plexus: Peri-Arterial Sympathectomy (Ueber die physiologische Wirkung der Exstirpation des periarteriellen sympathischen Nervengeflechtes: periarterielle Sympathektomie). *Klin. Wchnschr.*, 1922, i, 1402.

Even in a peri-arterial sympathectomy performed according to the Leriche method, it is seen on separating the adventitia that the caliber of the dissected portion of the vessel gradually diminishes. This contraction lasts up to six hours in the exposed area and occasionally inhibits the peripheral pulse. Ultimately the tension which prevailed previous to the operation is exceeded. Evidently there is first an irritation of the skin and then a hyperæmia which causes paralysis of the vasoconstrictors. The effect of adrenalin was not considered as the experiments were performed under anæsthesia. Hyperæmia is regarded as the most important factor in the cure of vasomotor trophic disturbances.

WASSERTRUEDINGER (Z)

MISCELLANEOUS

BLOOD

Broun, G. O.: Blood Destruction During Exercise; Blood Changes Occurring in the Course of a Single Day of Exercise. *J. Exper. M.*, 1922, xxxvi, 451.

The studies of several investigators have shown that normally the destruction of erythrocytes is accomplished, in part at least, by a process of fragmentation in the blood stream. There is evidence that the breaking up is the result of mechanical injury.

The investigations here reported by Broun were undertaken to determine whether an increased rate of blood destruction can be demonstrated during exercise. Since the subject is so closely linked with the general question of fluid and cell changes during exercise, a number of observations were made in this connection, and it is with the latter that this article is largely concerned.

Two types of blood volume determination have shown themselves to be of practical value for use on the living animal. The first is the well-known carbon monoxide inhalation method. The second entails the addition of some substance to the blood plasma and the subsequent determination of its degree of dilution. Since the carbon-monoxide method cannot be repeated readily within a single day, the dye method was adopted for use in the author's experiments.

The experimental animals were dogs. The chief reason for choosing dogs, apart from their general utility, was the special susceptibility of their red corpuscles to mechanical injury. The animals were kept in individual cages and fed upon a mixed diet containing considerable meat. To prevent changes in the blood volume, food was not given upon the day of the experiment until after the last blood-volume determination had been completed. For purposes of exercise treadmills were used. The number of miles traveled was recorded by a bicycle cyclometer attached to the machine.

Previous studies by other men have shown that considerable reliance may be placed on plasma volume figures obtained by the vital red method. The author's findings indicate that the initial concentration of the blood during exercise is not due to a loss of fluid, since there is no decrease in the plasma volume. On the contrary, one investigator reports that there is a distinct increase, especially when the exercise is prolonged.

The calculation of total cell volume was made on the basis of the percentage volume of cells in the blood of the jugular vein, the total plasma volume being known. Hæmoglobin, pigment volume, and red-cell count are also influenced by changes in the ratio of cells and plasma. The initial increase in the total cell volume observed in these experiments could not have been due to mere swelling of the cells as the hæmoglobin also increased.

It is not impossible that changes in the size of the red cells occur during exercise. A general swelling of the cells might readily lead to an increase in the cell volume. However, the close parallelism between the curves for cell volume and pigment volume indicate that the results were not due to this cause for if this were the case there would have been disproportionate changes in the pigment content and cell bulk. The red counts recorded by the author were too few in number to furnish reliable data as to average cell size and the literature on changes in cell size during exercise is extremely meagre.

Price-Jones, working with dried blood smears, concluded that the cells become larger. The author's findings tend to confirm this view as the decrease in the cell volume during prolonged exercise is not nearly so great as the decrease in the pigment volume.

Broun states that after prolonged exercise both total cell volume and pigment volume fell well below the maximum noted after ten minutes of exercise. Because of the uncertain factor of cell distribution it would be unsafe to conclude that blood destruction occurs during exercise, on the basis of the data of these experiments alone, although there is no doubt that the findings are in harmony with such a view.

From his findings the author draws the following conclusions:

1. An increase in the percentage of cells and hæmoglobin in the blood of the jugular vein occurs early in the course of exercise and probably results from redistribution of the red corpuscles, increasing their proportion in the peripheral blood.

2. As exercise is continued, there is a definite increase in the plasma volume.

3. A coincident decrease in the total cell volume and the pigment volume during prolonged exercise suggests blood destruction.

GEORGE E. BEILBY, M.D.

BLOOD AND LYMPH VESSELS

Witte, W. C. F., and Zilisch, H. E.: Traumatic Rupture of the Femoral Artery with Hæmatoma. *Wisconsin M. J.*, 1922, xxi, 218.

The authors report a case of traumatic rupture of the femoral artery in a boy 17 years of age, due to a motor-cycle accident. The patient was brought to the hospital in a state of shock with a firm, non-pulsating mass 10 in. in diameter in the left inguinal region between the skin and muscles of the abdominal wall. The leg showed sensory and motor disturbances. Pulsation was noted in the popliteal space.

Morphine was administered and external heat applied. The next day the artery was ligated. On the twelfth day amputation of the leg was done because of the development of dry gangrene of the foot with a definite line of demarcation below the knee.

Operation is contra-indicated in shock unless it is necessary to save life or the condition is becoming rapidly worse. In the treatment of shock the psychic element must not be forgotten. Heat is essential. The feet should be raised to prevent cerebral anæmia, and if the blood pressure falls below 80, saline or glucose solution should be given intravenously or subcutaneously. Transfusion of blood is indicated by persistent hæmorrhage. Hot rectal enemas of coffee or whiskey are of great benefit. Strychnine is contra-indicated. MARCUS H. HOBART, M.D.

Cornioley: Surgery of the Arteries: Transplantation of Arteries by the Nageotte Method (La chirurgie artérielle: tentative de greffes artérielles par la méthode de Nageotte). *Schweiz. Rundschau f. Med.*, 1922, xxii, 238.

War surgery made little progress in the surgery of the arteries. As ligation of the main arteries (humeral and femoral) leads to gangrene in 40.2 per cent of the cases, the continuity of the vascular lumen must be maintained as much as possible. In experiments in which a calf artery 3 cm. long was implanted into the carotid artery of a dog according to the method of Carrel with interrupted sutures the tube healed but soon became impermeable although an attempt was made to prevent coagulation by previous irrigation with citrate solution. In vascular suturing the interrupted suture is better than the continuous suture. STRAUSS (Z).

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Chiari, O. M.: Extirpation of the Adrenals in Epilepsy (Zur Frage der Nebennierenexstirpation bei Epilepsie). *Deutsche Zeitschr. f. Chir.*, 1922, clxxii, 244.

The von Haberer and the Schmiden clinics have abandoned this operation. Following a technically difficult extirpation of the adrenal gland done by von Haberer in the case of an epileptic 29 years old a subphrenic abscess and empyema developed. During the stormy convalescence the epileptic attacks became less frequent, but later reappeared again in their original severity. RAUSCHKE (Z).

Kremer, H.: Singultus (Ueber den Singultus). *Ergebn. d. Chir. u. Orthop.*, 1922, xv, 562.

Hiccough is due to a clonic spasm of the diaphragm resulting from stimulation of the respiratory center. It may be caused: (1) through the central nervous system; (2) chemically, through the blood stream; and (3) reflexly through stimulation of sensory fibers of the phrenic and sympathetic nerves.

The author discusses singultus as a symptom of disease, citing a few illustrative cases from the literature.

The various types of singultus include the fetal singultus, the unilateral clonic spasm of the diaphragm, and the postoperative singultus appearing particularly after operations on the stomach and the urinary tract.

The treatment indicated when other remedies fail is phrenicotomy or blocking of the phrenic nerve by the injection of novocaine or freezing.

In a case reported numerous drugs were found of no avail, and even after a unilateral phrenicotomy the singultus returned. After division of the phrenic nerve on the other side a cure was effected through complete paralysis of the diaphragm. The patient then complained only of slight dyspnœa in the dorsal position. PASCHEN (Z).

ROENTGENOLOGY AND RADIUM THERAPY

Duane, W.: The Scientific Basis of Short Wave-length Therapy. *Am. J. Roentgenol.*, 1922, ix, 781.

Recent advances in roentgen therapy have emphasized the importance of employing very penetrating radiation, and of accurately estimating the dosage. The primary object of roentgen therapy in the treatment of malignant disease is the destruction of the tumor tissue. If the tumor lies some distance below the surface of the skin, the radiation projected into the tumor must first pass through the skin itself and the intervening tissues. The amount of radiation that can be projected into and absorbed by the tumor depends upon the tolerance of the skin and intervening tissues.

Three factors determine the fraction of the radiation reaching the skin which penetrates to the tumor

below, viz.: (1) the inverse square law, (2) the absorption of radiation by the tissues, and (3) the effect of secondary radiation.

The first factor is a question of solid geometry only. Its magnitude does not depend upon the kind of roentgen rays used. The other two factors differ in magnitude for different kinds of roentgen rays. In general, tissues absorb less radiation if the wave length is short than if it is long. Secondary radiation also depends upon the wave length. If the wave length is short, a larger amount of secondary radiation will reach the tumor than if the wave length is long. It is therefore a problem of great importance in deep roentgen therapy to produce roentgen rays of short wave length.

The practical solution of measuring roentgen-ray wave lengths, the determination of just what wave lengths a roentgen tube produces when operated at a certain voltage, the effect of interposing absorbing materials or filters in the path of the rays, the variation depending upon the mode of exciting the tube, the differences produced by using tubes with anodes of various metals, are problems with which the author has concerned himself for a number of years. Much of the research work along these lines is described briefly.

Since many factors enter into the production of the beam of roentgen rays, the roentgenologist should use some method of measuring the radiation in estimating the dosage instead of trusting to measurements of voltage, current, filtration, and focal distance. The use of an ionization chamber for this purpose has proved satisfactory. The author describes this chamber and the method of using it. The present methods of measuring roentgen-ray intensities and wave lengths are much more accurate than those employed in the determination of the biological effects produced by the rays. Because of the increase in the accuracy of estimating dosage, the roentgenologist now possesses a method of treating certain types of disease that is not excelled in precision in any other branch of medicine or surgery. ADOLPH HARTUNG, M.D.

Levin, I.: The Intraperitoneal Insertion of Buried Capillary Glass Tubes of Radium Emanation: Results in Two Cases of Tumor of the Gastro-Intestinal Tract. *J. Am. M. Ass.*, 1922, lxxix, 2074.

The burying within tumors of capillary glass tubes containing radium emanation is a comparatively new departure in radium therapy. In the course of the last two and a half years the author has used this method extensively in cases of intraperitoneal tumors of the gastro-intestinal tract, the uterus, and the ovaries, and in the treatment of retroperitoneal tumors. An exploratory laparotomy is performed. When it is found that the tumor cannot be completely removed by operation the emanation tubes are inserted into it and the necessary palliative surgical procedures are then carried out. The laparotomy incision is sutured immediately.

Two cases are reported in detail. One was a case of obstructing tumor in the second portion of the duodenum, and the other a case of tumor of the transverse colon. In both cases the obstruction was removed in large part and the patient's condition markedly improved.

The method is still too new to warrant conclusions as to its final results in cancer, but its efficiency is evidenced by the results obtained in the two cases reported in this article and several others which will be reported later. Following its use the patient makes an uneventful recovery, and there is no rise in temperature and no peritoneal irritation or subsequent sloughing of tissues. The insertion of radium emanation does not add in the least to the hazard of the operation. The tumor diminishes in size considerably in the course of from six to eight weeks.

ADOLPH HARTUNG, M.D.

GYNECOLOGY

UTERUS

Heineberg, A.: An Improved Method of Supporting the Bladder and Vagina After Vaginal Hysterectomy for Procidentia. *Am. J. Obst. & Gynec.*, 1922, iv, 634.

In the operation described the uterus is removed in the usual manner and the broad ligaments are ligated in sections close to the uterus. The uppermost ligature includes the uterine end of the tube and round ligament.

If the tubes and ovaries are removed, the infundibulopelvic ligament is drawn over and its inner end included in the ligature applied to the uterine end of the round ligament.

The upper stumps of the broad ligament thus formed are then brought across the median line of the pelvis so that the stump of the left ligament may be sutured to the cut edge of the right vaginal wall and the stump of the right ligament sutured to the left vaginal wall. The stumps are not brought into the vagina but are inserted into a pocket external to the upper end of each lateral wall of the vagina.

The traction made upon the vaginal walls must be carefully gauged. It is adjusted by drawing down the ligament, determining its length and tension, and selecting the point at which it should be sutured to the vaginal wall. The suture employed, a purse-string suture, includes with the broad-ligament stump about one-fourth of the circumference of the opening of the vaginal wall on each side and supports and contracts the vaginal vault. The sutures on both sides are applied before either is tied. While traction is made upon both ends of each suture, the ligaments being drawn into the position they are to occupy, the end of the posterior vaginal wall is sutured to the posterior surface of the interposed ligaments. After the resection, the upper edge of the anterior vaginal wall is sutured to the anterior surface of the ligaments.

The advantages of crossing the broad ligaments and attaching each of them to the vaginal wall of the opposite side are that a shelf is formed for the bladder, the opening in the vagina is closed by means of oblique traction upon its walls, and dilation of the vaginal vault and consequent lessening of the support of the base of the bladder are prevented.

E. L. Cornell, M.D.

Corscaden, J. A.: Statistics and Technique in the Treatment of Fibromyoma of the Uterus by Radiotherapy. *Am. J. Roentgenol.*, 1922, ix, 512.

The object of this study is to outline the procedures employed in treating fibromyoma of the uterus and hemorrhage from other benign causes, to present a series of statistics giving the effects of the treatment on the symptoms and lesions, and to discuss late symptoms which might be ascribed to the methods used. The study was based on 250 cases, of which 203 were treated between June, 1914, and July 1, 1922.

Stress is laid on the importance of preparation preliminary to the treatment and the proper selection of cases. Radium is used if the woman is over 38 years of age and bleeding is the important symptom, in the cases of younger women with a definite myoma in which operation is contra-indicated, and in the cases of young women without myoma suffering from uterine bleeding associated with tuberculosis or other serious disease in which pregnancy would not be advisable. Dilatation and curettage, followed if necessary by roentgen-ray treatment, are employed in the cases of young women when it is desired to cause a temporary menopause or merely to lessen the flow. As even moderate doses of radium in the uterus cause sclerotic changes predisposing to dystocia, roentgen rays are preferable. If the patient is a good surgical risk, if she is under 38 years of age, if the mass is over 15 cm. in diameter, if the diagnosis is doubtful (especially if ovarian tumor is probable), if there is evidence of degeneration or inflammation in the growth, if there are submucous pedunculated myomata, and if the pain or urinary symptoms are the important factors, some type of excision is employed in preference to radiotherapy.

In the treatment of women 40 years of age or older, radium is usually used in doses of about 1,200 to 1,500 mgm.-hrs. but the dosage is increased if the bleeding is thought to be due to ulceration or if the tumor increases the distance from the radium to the ovary. A larger dosage is used also for young women when a permanent menopause is desired. The radium acts on the endometrium, the uterine muscles, and the ovary. It is therefore distributed in small units in order to minimize the slough in the endometrium, and is placed well in the fundus to avoid the cervix if possible. The Dominici tubes are placed in rubber tubes 1 mm. thick.

Supplementary roentgen-ray treatment is given a large tumor when it is believed that a permanent menopause will not result from the intra-uterine application of the radium. It is used also whenever there is a recurrence of bleeding, especially if the recurrence is persistent.

A general summary of the effects of irradiation shows that the bleeding either ceased or became normal in 40 per cent of the cases after one radium application and roentgen-ray series, within a month after operation in 21 per cent, within two months in 13 per cent, and within six months (usually three) in 10 per cent. In 14.5 per cent a recurrence developed which required supplementary treatmen-

or stopped spontaneously. In about 1.5 per cent (three cases) the treatment failed. The results were more or less the same among the different types of cases except that they were uniformly slow in tumors of large size. Dysmenorrhœa ceased in all cases, showing that the pain depended on menstruation. On the other hand, pain in various parts of the body and unassociated with menstruation was not satisfactorily relieved; neither were urinary symptoms. The effect on the size of the mass varied greatly.

The immediate effect of the treatment on the patient was slight in the majority of cases. The roentgen ray usually caused nausea and slight malaise and, rarely, diarrhœa or vomiting. Following the intra-uterine application of radium the symptoms were the same. The late effects were practically the same as those which occur during the normal menopause. These effects are discussed at some length.

The author attempted to estimate the desirability of the method by balancing the harm done with the benefits obtained in each case. Such a survey showed that the method was unqualifiedly successful in 91 per cent of the cases. In 3 per cent, more harm than good resulted, and in 6 per cent, errors in judgment or technique qualified the result.

The following conclusions are drawn:

1. Radiotherapy of a myomatous or grossly normal uterus will stop all bleeding not due to ulceration, cause a myoma to shrink more or less rapidly, and arrest dysmenorrhœa.

2. Radiotherapy will only partially relieve urinary distress and pain not associated with menstruation.

3. As a result of the artificial menopause from radiotherapy, hot flushes are the rule and in some cases there is an increased nervous irritability.

4. In the majority of patients nervousness is diminished, probably because of the improvement in the general condition.

5. The condition of women suffering from nervous disorders may be made worse.

6. Changes in secondary sexual characteristics and in sexual desire and satisfaction are negligible.

7. Blood-pressure studies are unreliable. There seems to be an elevation in blood pressure in 16 per cent of the cases treated.

8. Normal pregnancy is possible after a temporary menopause.

ADOLPH HARTUNG, M.D.

Beclere, M.: What Is the Best Method for the Treatment of Uterine Fibromyomata by Means of the Roentgen Rays? *Am J. Roentgenol.*, 1922, n.s., ix, 797.

Thousands of observations made in all countries have demonstrated the efficacy and harmlessness of roentgen therapy in the treatment of uterine fibromyomata. Two questions pertaining thereto require further discussion, namely: (1) the contra-indications to the use of the roentgen rays, and (2) the best method of employing them.

Today, roentgenotherapy is contra-indicated only when surgical intervention is absolutely necessary. The method used depends upon the choice of the portals of entry and the desirability of giving the treatment in one or several sittings. Theoretically, the first point depends upon whether the operator believes the desired effect is obtained by castration of the ovaries, as maintained by most German radiotherapists, or that direct action is exerted upon the myomata in addition to the ovaries. The latter view is held by the majority of French radiotherapists and by the author, this assumption being based on the progressive decrease which occurs in the size of the tumor before the amenorrhœa sets in. Practically, the methods employed by the Germans and the French give the same results because the portals of entry chosen invariably encompass the myomatous uterus as well as the ovaries.

With regard to the value of the single intensive irradiation advocated largely by the Germans, as compared with repeated smaller irradiations, the author states that a massive dose given at a single session of short duration will give a result more speedily but does not take into account the variable radiosensibility of different persons, is not always effective or sufficient, and may cause a reaction in the form of irradiation sickness which incapacitates the patient for some time.

The giving of divided doses, as advocated by the French and by the author, has the great advantage that it does not cause any marked functional trouble and therefore does not oblige the patient to alter her mode of living or give up her work. Its chief value consists in the direct action of the weekly irradiations upon the myomata which causes progressive destruction of the neoplastic tissues. By this method the total destruction of the ovarian follicles is more definitely assured and the dosage is suited to the patient's radiosensibility.

ADOLPH HARTUNG, M.D.

Davis, L.: Observations on Cancer of the Uterus. *Rhode Island M. J.*, 1922, v, 333.

Three hundred and forty-eight operations for cancer were performed in the Massachusetts General Hospital in 1919 and 432 in 1920. Radical surgical removal of deep-seated cancer yields a definite percentage of truly permanent cures. Recent figures reported before the meeting of the American Surgical Association last May showed 60 per cent of five-year cures in breast cancer without glandular involvement. In cancer of the lip the results are even better.

Although cancer of the uterus gives distinctive signs, it is rarely detected early. The United States mortality records for 1914 list 12,000 deaths due to cancer of the female generative organs. Ninety per cent of these were due to cancer of the uterus. As the annual increase of the death rate from cancer is about 2½ per cent, it is probable that today 1,000 women die from cancer of the uterus every month.

The precancerous cervix is not easy to describe but there are certain conditions which are generally supposed to predispose to cervical cancer. Among

the latter are deep indurated lacerations with eversion and ectropion which bleeds when touched. A granular area with definite margin which is distinctly elevated above the surrounding tissue, hard to the touch, confined to one lip, and bleeds easily suggests squamous-cell carcinoma. The inverting type of adenocarcinoma, however, may honeycomb the cervix with little or no external manifestation.

Adenocarcinoma of the body of the uterus remains localized for a comparatively long time. The results of total hysterectomy are therefore excellent, a five-year cure being obtained in about 75 per cent of the cases.

Squamous-cell epithelioma of the cervix is far more malignant than adenocarcinoma and six to eight times as frequent. Because of its malignancy there is a growing tendency to regard radium therapy as better than surgery. The author does not share this view. He still advises curettage and cauterization of the cervix followed in ten days by complete hysterectomy with removal of a good-sized cuff of the vaginal wall. By this treatment he has obtained a cure in 40 per cent of his cases.

PAUL W. SWEET, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Efilmescu: Pyosalpinx Opening into the Urinary Bladder; Operation; Cure (Pyosalpinx in der Urinblase eroffnet; Operation, Genesung). *Spitalul*, 1922, xli, 294.

In the case of a girl, aged 18 years, whose condition was diagnosed as pyonephrosis, the author found bilateral adnexitis. On the right side was a swelling the size of an orange which the cystoscope showed to be a bullous œdema in the trigone of the bladder. The right ureter could not be found. Pressure on the swelling caused immediate turbidity of the urine. The author performed an abdominal pan-hysterectomy. A fistula the size of a lentil was found between the right tube and the bladder. The patient was cured. STOLANOFF (Z).

Hirst, J. C., and Mazer, C.: The Rubin Test and Its Therapeutic Application. *Am. J. Obst. & Gynec.*, 1922, iv, 628.

Of seventy women seeking treatment for sterility, sixty-four had never been pregnant, the period of sterility ranging from three to twelve years. Occlusion of the tubes was found in twenty-eight of the sixty-four cases of absolute sterility and in two of the six cases of relative sterility. Sixty of the seventy women had had surgical treatment for the condition. Some of them had been curetted three times, a few had had plastic operations on the cervix, and several had been subjected to an abdominal operation, apparently for retroversion. None had escaped the annoyance and expense of frequent office treatments supplemented for long periods by vaginal douches.

The incidence of occlusion of the tubes was higher in the women who had been subjected to an operation for the relief of the sterility than in those who had not been operated on.

It is contended by some gynecologists that 70 per cent of the cases of primary sterility in the female yield to dilatation and curettage supplemented by various non-operative measures. This percentage the authors believe is far too high. In 42.5 per cent of the cases of primary sterility there is occlusion of the fallopian tubes, a condition which precludes the possibility of pregnancy without recourse to an operation. The treatment of sterility in the female should never be undertaken without definitely excluding the presence of occlusion of the fallopian tubes. The fear of air embolism is unfounded. In no instance were there symptoms pointing to this condition.

Following a plastic operation on the tubes for the relief of sterility, intra-uterine gas inflation will reveal the results of the treatment and will aid in keeping the tubes patent.

One negative result is not enough to establish non-patency.

Occasionally a polyp in the horn of the uterus may occlude the tubal ostium as a ball valve, and greater pressure will succeed in forcing the gas through. In such event a careful exploration of the uterine horns by means of the curette and placental forceps is indicated.

Very few cases of primary sterility give a history of acute pelvic infection. In some instances occlusion of the tubes may be due to catarrhal salpingitis. The latter condition, which generally goes unrecognized to resolution, is characterized in its primary stage by hyperæmia and thickening of the mucous membrane, increased secretion from the mucosa, and some destruction of the cilia. When it subsides, the acute condition may leave sufficient inspissated mucus in the tubal lumen to cause occlusion. In such cases the tubes may be opened by gas-inflation of the uterus which will dislodge the mucus.

E. L. CORNELL, M.D.

Schiller, H.: Does the Ovum or Corpus Luteum Control the Ovarian and Uterine Cycle? *Am. J. Obst. & Gynec.*, 1922, iv, 651.

Ovarian and uterine cycles are governed by the ovum and follicle. The ovum is the beginning and the end of all sexual function; it determines in early embryonic life the formation of the female organs and the female sex characteristics, and later governs all general and biological changes during the period of active sex function.

The true pregravid decidua is the result of hormonal action of the corpus luteum.

Menstruation occurs because the ovum is not impregnated.

Corpus luteum extract causes hypertrophy and hyperæmia of the uterus and tubes, but only in the presence of the ovaries. Theoretically its greatest therapeutic result should be expected in menorrhagia, metrorrhagia, and hypoplasia.

E. L. CORNELL, M.D.

Meigs, J. V.: Fibroma and Sarcoma of the Ovary. A Report of Two Unusual Ovarian Tumors. *Boston M. & S. J.*, 1922, clxxxvii, 952

The ovarian tumors reported were removed at the Free Hospital for Women in Brookline, Mass. The author states that no case of either of these types of mixed tumor of the ovary has been reported in the literature. The case histories are given in considerable detail.

The final diagnosis in the first case was endometrial polyp; atrophying endometrium, normal tubes, multiple leiomyomata of the uterus; small fibromata of the right ovary; fibrosarcoma of the left ovary.

In the second case the final diagnosis was atrophied endometrium; normal appendix; hydrosalpinx; bilateral malignant papillary cystadenoma with epithelium of the serous type; bilateral metastatic adenocarcinoma; fibroma of the ovary.

C. H. Davis, M.D.

EXTERNAL GENITALIA

Rosenstein: The Formation of a Vagina in Congenital Vaginal Malformation (Zur Scheidenbildung bei angeborenem Vaginaldefekt). *Monatsschr. f. Geburtsh. u. Gynaek.*, 1922, lviii, 176.

The two procedures used today for the formation of a vagina are the small-intestine plastic of Baldwin-Mori and the rectal plastic of Schubert. The latter is less dangerous than the former.

In forty-seven cases operated upon up to the present time by the Schubert technique there were no deaths, while in forty-nine cases in which the Baldwin-Mori technique was employed there were ten deaths. The Schubert operation is also much simpler than the Baldwin-Mori technique, being an extraperitoneal procedure performed in one stage while the Baldwin-Mori technique requires a vaginal operation and a laparotomy with resection of the small intestine.

The author reports a case he operated upon by the Schubert method. The patient was discharged with a good result at the end of thirty-four days.

Wohlgemuth (Z).

Rosenthal: The Formation of an Artificial Vagina (Ein Beitrag zur kuenstlichen Scheidenbildung). *Zentralbl. f. Gynaekol.*, 1922, xlvi, 1102.

A 21-year-old girl with complete absence of vagina and uterus was operated upon according to the Mori-Baldwin-Haeberlin method. A loop of small intestine 15 cm. in length was cut out 70 cm. above the cæcum and the four openings were closed. Side-to-side anastomosis was then done. The mesentery of the loop which was cut off was left intact and implanted into the vulva without tension at a point 3 cm. above the lower end. One and one-half years later the vagina was penetrable for two fingers. Its end could not be reached. Secretion was very slight, and there was no intertrigo.

Kulenkampff (Z).

Bullock, H. A.: Utero-Vesico-Vaginal Fistula. *Med. J. Australia*, 1922, ii, 709.

The case reported was that of a woman 41 years of age who had been married for fifteen years and had had eight children, the youngest of which was 3 years old at the time the patient was seen by Bullock. All the births were spontaneous except the last. The last labor began suddenly with a considerable loss of blood. The patient remembered nothing regarding it except that she had been taken in a semi-conscious condition to a hospital where an anæsthetic was administered and was later told that the child was delivered by forceps. She was very ill for three weeks and confined to the hospital for three months.

After this birth on July 6, 1920, she did not pass urine naturally until operated upon by the author September 27, 1921. On examination, the os uteri was found to be cut off completely from the vagina. There was not the minutest passage by which a fine probe could be passed into the uterus from the vagina.

Cystoscopic examination revealed a rent on the posterior wall of the bladder which obliterated the right ureteral orifice. It was then decided to explore the abdomen through an incision in the middle line above the pubes. The fundus of the uterus was found tilted forward and bound firmly to the bladder by a hard, inflammatory mass which invaded the right side of the broad ligament. The left fallopian tube and ovary were freed from the uterus and the left ureter was exposed to make certain that it would not be injured. The right ovary and fallopian tube were removed. No trace of the right ureter could be found for 7.5 cm. from the bladder, as this portion was inextricably bound up in the inflammatory mass extending from the bladder into the broad ligament.

The uterus and the upper third of the vagina were removed with the inflammatory mass in the broad ligament. During this step of the operation the urinary bladder was necessarily opened. The right ureteral orifice then appeared as a small saccule about 6 mm. in depth. The right kidney was atrophied. The ragged edges of the bladder were freshened and sutured together with catgut sutures in two layers. The vagina, which had been separated from the bladder, was then closed around a small drainage tube, and the peritoneum sutured.

A second rubber drainage was placed at the point where the bladder rent was sewed up adjacent to the upper end of the tube placed in the vagina, brought through a small opening left in the peritoneum of the broad ligament, closed over with peritoneum in the manner in which the stomach wall is folded in Witzel's gastrostomy, and brought out through the midline incision in the abdomen.

Both drainage tubes were removed by the third day, and the patient was out of bed on the twenty-third day after the operation.

A cystoscopic examination made August 14, 1922, revealed phosphatic incrustations along the line of

the scar in the bladder and slight cystitis. The incrustations were freed by rubbing the cystoscope along the line of the scar and drawn off later by Bigelow's evacuator.

The patient today enjoys remarkably good health and her only inconvenience is slight chronic inflammation of the bladder which is gradually improving.

C. H. Davis, M.D.

MISCELLANEOUS

Chase, H. C.: Levator Hernia (Pudendal Hernia); Report of a Case Operated upon by the Combined Route; Review of the Twelve Previously Reported Cases. *Surg., Gynec. & Obst.*, 1918, xxxv, 717.

In the author's opinion, Blake's term "levator hernia" is more appropriate for the condition under discussion than the term "pudendal hernia." Von Winckel suggested the term "subpubic hernia." Pudendal herniæ are separated from perineal herniæ by the transverse perineal muscles.

Levator herniæ may be congenital or acquired. These two forms may be subdivided into: (1) direct herniæ, or those anterior to the broad ligament; (2) indirect herniæ, or those posterior to the broad ligament; and (3) combined anterior and posterior herniæ. In the last type the sac pushes forward under the broad ligament and breaks through the levator muscle. The point of entrance of the posterior or indirect hernia is at the internal weak point of the pelvic diaphragm where there is no covering by the levator muscles and the rectovesical fascia is separated from the ischiorectal fascia by only the areolar tissue. The posterior hernia is more common. In front of the broad ligament the levator muscles overlap and there is no weak point. Hence only the traumatic herniæ are anterior.

The internal boundaries of the posterior hernia are the broad ligament, the rectum and the sacrouterine ligament, and an imaginary line between two sides of the triangle. The anterior hernia is bounded by the uterus and bladder, the round ligament, the vagina, and the transverse perineal muscles. The base is formed by the linea terminæ of the pelvis.

In the posterior hernia the sac is long and definitely defined and contains the gut and the bladder or the gut, the ovary, and the tube. The combined type of hernia contains both bowel and bladder. In the anterior hernia the sac is less defined and only partial because the bladder, which always constitutes its contents, is only partially covered with peritoneum.

The posterior hernia passes downward and forward, perforating first the rectovesical fascia and then the ischiorectal fascia to its exit. The combined hernia burrows forward and downward under the broad ligament, perforating only the rectovesical fascia, and becomes anterior to the broad ligament before perforating the levator muscle. The anterior hernia passes directly downward to the ring and point of exit.

The external ring is bounded externally by the ascending ramus of the ischium and part of the descending pubic ramus, mesially by the vagina, and posteriorly by the transverse perineal muscles. The constrictor cunni muscle is internal and the ischiocavernosus external. This weak triangle of exit is covered only by two layers of the thin triangular ligament.

The posterior hernia is covered by skin, mucosa, and peritoneum, and penetrates the two layers of the triangular ligament, the ischiorectal fascia, the levator muscle, and the rectovesical fascia. The anterior hernia penetrates the same structures but the peritoneum only partly forms the sac.

The weak spot in the pelvic diaphragm is at the site of the rectosigmoid junction. The long pelvic loop of the sigmoid slides downward and becomes part of the contents of the hernial sac. The kink and the partial obstruction at the rectosigmoid junction account for the intermittent rectal symptoms.

Pregnancy and parturition are the most important etiological factors. The majority of the herniæ begin or are first noted during labor or soon afterward. The trauma of a difficult or an instrumental delivery may favor the condition. Not a single verified case in the male has been reported. The youngest patient mentioned in the literature was 27 years of age, and the oldest 51.

A levator (pudendal) hernia always appears in the posterior part of the labium majus. The mesial half of the protrusion is covered with mucous membrane and the other half with integument. The ordinary signs of hernia, such as impulse on coughing and reducibility, are noted. These factors differentiate levator hernia from inguinal and femoral hernia. Bartholinian abscess, rectocele, and cystocele are readily differentiated.

The treatment consists in high ligation and excision of the sac, and closure of the ring. In cases of posterior hernia this may be done when there is a definite sac. In cases of anterior hernia, with greater destruction of the levator muscle and fascia, especially when areas have been torn away by a forceps operation and ligation and removal of the sac are impossible, closure of the ring may be accomplished by transplanting a pedicled flap of iliac fascia between the transplanted pedicled round ligaments to close the defect above and a pedicled flap of fascia lata to plug the subpubic triangle below.

The author gives the histories of twelve cases of pudendal hernia collected from the literature and one of his own. Only one case was cured. In Chase's case the hernia was of the combined type. The patient was an obese, well-developed woman who had had six children and three miscarriages. The chief complaints were a bearing-down pain in the lower right abdominal quadrant, the right labium, and the vagina; a sense of pressure and a bearing-down feeling in the rectum and bladder on coughing or straining; and a sensation suggesting that the contents of the pelvis were dropping out. The condition

developed suddenly about the fourth month of pregnancy and grew worse after the forceps delivery of a full-term, normal child.

When seen by the author the hernia was the size of a fist, and the patient was three months pregnant. Operation was done in several stages. The first stage, consisting of dilatation and curettage, bilateral salpingectomy, withdrawal of the gut and bladder from the sac, closure of the hernial ring, and sigmoidopexy, was followed by plastic repair through a vaginal incision, with high ligation and excision of the sac, closure of the slit in the levator muscle and ischiorectal fascia, and perineorrhaphy. The patient made a satisfactory recovery and has remained perfectly well during the past year.

The author draws the following conclusions:

1. Pudendal hernia, although extremely rare, should be easily recognized.

2. Cases should be divided into anterior, posterior or combined types as a basis for operation. Every case should be subjected to operation.

WALTER C. BURKET, M.D.

Mattmueller, G.: A Contribution to the Statistics of Carcinoma of the Genital Organs (Beitrag zur Statistik der Genitalcarcinome). *Zeschr. f. Geburtsh. u. Gynaek.*, 1922, lxxxv, 126.

The author reports on 620 cases treated at the Basle Woman's Hospital from 1899 to 1918. In most of the cases the condition occurred during the forty-sixth to the fifty-fifth years of life. Carcinoma of the vaginal portion of the cervix, the cervix, the tubes, and the ovaries occurred between the forty-sixth and fiftieth years, that of the body of the uterus between the fifty-first and fifty-fifth years, that of the vagina between the fifty-sixth and the sixtieth years, and that of the vulva between the sixty-first and seventieth years.

Carcinoma of the ovary occurs most often in young women. The percentage relationship was as follows: in the vagina, 2.8; the vulva, 3.2; the ovary and tube, 7.8; the body of the uterus, 15.0; the cervix, 32.7; and the vaginal portion of the cervix, 38.5. The large number of vaginal carcinomata was striking, as the primary carcinoma is believed to be very rare. Also striking was the large number of cases of carcinoma of the body of the uterus. Almost one-third of the carcinomata of the uterus were in the body of the uterus.

Women who have given birth to children or have aborted several times are more apt to have carcinoma of the cervix, whereas those who have never given birth to children are affected more frequently by carcinoma of the corpus. Previous gynecological diseases seem to have no influence upon the development of carcinoma. The relative rarity of endometritis in the histories of patients with carcinoma of the uterus is also striking.

An interesting feature was the period of time elapsing between the first sign of the disease and the time medical aid was sought. The author gives the average as 7.8 months but this figure is not very accurate as he included also carcinomata of the ovary which cause late symptoms. From 1899 to 1914, the operability of the carcinomata gradually increased, from 1914 to 1918 (during the World War) it decreased, and from 1918 to date it has increased.

With regard to the duration of the disease up to the time of death, calculations could be made only in 235 cases (38 per cent). Many patients, chiefly those seen during recent years, are still alive. Of the 235 women, 197 were operated on and eighty-eight were inoperable. In the cases in which operation was done, the average period of life was 19.4 months and the primary mortality 16 per cent. In the inoperable cases the duration of life averaged 11.5 months. If carcinoma of the cervix is considered separately, it is evident that of the 147 women subjected to operation those on whom a cervical operation was done lived a shorter time than those with carcinoma of the cervix who were not operated on. Women operated on but not given radiation treatment lived about thirty-six months, while those operated on and subsequently given radiation treatment lived only nineteen months. Women whose condition was inoperable and who were not given radiation treatment lived ten months, while those with equally advanced carcinoma who were irradiated lived fourteen months. With regard to each subject the author cites the statistics of other clinics for comparison. VON TAPPEINER (Z).

Clark, J. G., and Keene, F. E.: The Treatment of Cancer of the Pelvic Organs with Moderate Irradiation. *Am. J. Roentgenol.*, 1922, n.s. ix, 808.

The cases reviewed were as follows: cancer of the cervix, 291; cancer of the fundus, forty-one; chorioepithelioma of the vagina and uterus, four; cancer of the cervical stump, eleven; recurrent cancer of the vagina after hysterectomy, twenty-two; primary cancer of the vagina, twenty-nine; cancer of the urethra, eight; and cancer of the bladder, six. The results were poorest in the cases of cancer of the cervix. With possibly three or four exceptions the cases of cancer of the fundus were all inoperable, as judged clinically, but as compared with cases of cancer of the cervix they showed the same favorable difference in the results of treatment as is noted in the surgical treatment of lesions of these parts of the uterus.

Of the patients treated over four years ago for inoperable carcinoma of the pelvic organs 163 are dead, forty-five (20.9 per cent) are living, and seven have not been traced. Of those treated over five years ago 125 are dead, four cannot be traced, and thirty-one (19 per cent) are living and free from manifest evidences of the disease. The estimated percentage of patients treated for cancer of the cervix who are alive nearly or beyond five years after the operation is between 16 and 18. Of the 412 patients treated, the vast majority were in advanced stages of the disease, quite beyond the possibilities of surgical

intervention. A large number have had their symptoms mitigated or completely arrested for a time; the frightful hæmorrhages have been arrested for invariable periods, and frequently entirely stopped. In a smaller percentage, pain present at the time of treatment has been relieved. The number of cases which have been cured, as reckoned on a five year basis, was larger than expected.

On the basis of their study of these cases the authors have reached the following conclusions:

1. Radium in 100-mgm. amounts will yield most gratifying results if properly applied.

2. To pursue a set course without variation in the frequency of treatments, regardless of the progress of the healing, is hazardous.

3. To attain the best results, the first application should be made under nitrous-oxide anæsthesia as this permits a more careful examination and the radium can be brought more advantageously into contact with the malignant areas by means of radium tubes or radium needles. Gauze packing has proved of much greater value for protection than metal shields.

4. The process of cure passes through three stages: local destruction, connective tissue formation, and hyalinization.

5. A hysterectomy after successful irradiation of an otherwise inoperable case is hazardous.

6. The results of irradiation in cancer of the cervix may remove this class of cases from the surgical field.

7. Cases of cancer of the fundus, unless too far advanced, or unless operation is definitely contraindicated, should be subjected to hysterectomy followed from fourteen to twenty-one days later by light irradiation of the vaginal fornix.

8. Irradiation is dangerous immediately before or after an operation, and in fresh operative fields.

9. Frequent repetitions of irradiation are probably unnecessary and possibly hazardous as the chief blow is struck at the first application.

10. The development of irradiation fistulæ may be reduced to a minimum or almost completely prevented by pushing the healthy tissues away from the zone of intensive radiation by means of a well-placed vaginal pack. ADOLPH HARTUNG, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Lepeyre: Pregnancy After Operation for Cancer of the Breast (Cancer du sein opéré et grossesse). *Bull. et mém. Soc. de chir. de Par.*, 1922, xlviii, 1249.

Trout recently reported fifteen cases of pregnancy following ablation of one breast for cancer. In thirteen, cancer developed in the other breast after from two to ten years.

The author has observed two cases of pregnancy following operations for breast cancer. In both of these cancer developed in the remaining breast. The first case was that of a woman aged 40 years. Pregnancy ensued less than two years later and the cancer from which the patient died developed within the following six months, viz., in the sixth month of pregnancy.

The second case was that of a woman 43 years old. One and one-half years after a thorough radical operation the patient became pregnant and within six months cancer developed in the remaining breast and resulted in death.

These two cases fully bear out the findings of Trout, the only difference being in the earlier incidence of pregnancy and the consequently earlier recurrence of the cancer.

The author concludes that women who have been operated upon for cancer of the breast should be sterilized, preferably by radiation of the ovaries.

W. A. Brennan.

LABOR AND ITS COMPLICATIONS

Watson, B. P.: Further Experience with Pituitary Extract in the Induction of Labor. *Am. J. Obst. & Gynec.*, 1922, iv, 603.

In the 195 cases in which pituitary extract was used to induce labor the result was successful in 90 per cent. The maternal mortality was nil. There were no cases of laceration of the cervix and no greater incidence of pelvic floor lacerations than in ordinary labor. There were two cases of retained placenta and two cases of rather severe hæmorrhage accompanied by shock following the expulsion of the placenta. The latter were cases of primiparæ over 39 years of age. The number and nature of these complications was no greater than in a like number of deliveries in which no pituitary extract was used.

There were twelve fetal deaths, a fetal death rate of slightly over 6 per cent. Three of these children were monsters. Two died *in utero*, apparently from placental infection due to pregnancy toxæmia. Three died of cerebral hæmorrhage and two of atelectasis, within three days of birth. In two cases autopsy was not permitted. Taking into consideration the nature of the cases in which induction was carried out, the results, so far as the fetal death rate is concerned, compare favorably with those obtained by other procedures.

A great deal has been said and written regarding unfavorable effects on the mother from the administration of pituitary extract in the course of labor. In practically all such cases, however, the drug was incorrectly given. Pituitary extract should be used in the course of labor for one purpose only, viz., to stimulate uterine contraction when it is markedly inadequate.

To give pituitary extract when there is a rigid cervix or in a case of delay due to a small pelvis, a large head, malposition of the head, or a rigid pelvic floor is to court disaster. Rupture of the uterus and fetal death are bound to occur if it is used under such conditions. This is no argument, however, against its use in properly selected cases.

When pituitary extract is given to induce labor, the initial dose is ½ c.cm. If there is any idiosyncrasy to the drug on the part of the patient it is revealed at once as in a case cited, in which severe vomiting resulted. The administration can be then stopped. If the first dose causes no ill effects, subsequent doses will be equally well borne as the drug does not have a cumulative effect. In the author's experience the initial contractions induced have been of a severe tonic nature. The first contraction is usually longer than the succeeding ones, but the latter are of the nature of ordinary labor pains. In most cases they begin to die away in fifteen or twenty minutes and must be further stimulated by another dose of pituitary extract. If contractions can be kept up sufficiently long to start dilatation of the cervix and separation of the lower pole of the membranes, the labor will proceed naturally thereafter.

E. L. Cornell, M.D.

Beck, A. C.: Is Interference Justifiable After Twenty-Four Hours of Labor When No Other Indication Is Present? *Am. J. Obst. & Gynec.*, 1922, iv, 623.

As the private patients in the group studied were treated by a number of different men and no definite plan was followed in the care of the prolonged labors, only the service cases were considered from the standpoint of the end-results. In the 1,138 general service cases there were seventy-nine long labors. All but thirteen of these ended in spontaneous delivery. Forceps were used in six cases, either because of a marked change in the fetal heart rate or a prolonged second stage. Two breech extractions were done for the same reasons, and in five cases of relative disproportion in which the head failed to engage after a thorough test of labor cæsarean section was done. Three stillbirths and the deaths

of three infants on the first, fourth, and fifth days, respectively, made the infant mortality 7.6 per cent. One mother died on the third day after a cæsarean section. Additional proof of the value of conservatism is shown by the end-results in the entire series. Of the 1,138 deliveries which included this group of seventy-nine prolonged labors, twenty-one resulted in stillbirths and fourteen were followed by the death of the child within the first two weeks, a total infant mortality of thirty-five (3 per cent). Two mothers died, a maternal mortality of one in 569 cases.

From the fact that in many of these cases of prolonged labor the head was not engaged after twenty-four or even thirty hours of labor the author concludes that manual dilatation or incision of the cervix and forceps delivery would not have given as good end-results as those obtained.

Of the series of women studied, 1,735 were confined in the Long Island College Hospital and Out-Patient Department. One hundred and forty-six labors lasted over twenty-four hours. Of this number, 43.1 per cent terminated in twenty-four to thirty hours, and 56.9 per cent continued for more than thirty hours. Of the 556 primiparæ in the hospital series, 108 (19.2 per cent) were in labor more than twenty-four hours. Slightly over one-fourth of the 266 dry labors were prolonged.

Early rupture of the membranes seems to be the most common etiological factor. The exact cause responsible for the long labor in the rest of the cases is not known. The study of individual cases indicates that the chief difficulty is faulty uterine contraction.

In the conduct of labor the author gives the patient as much rest as possible. Her pulse and temperature and the fetal heart rate are carefully noted. Nourishment is given as frequently as the patient can be forced to take it. In the intervals between contractions she is urged to rest and, if possible, to sleep. As soon as the membranes rupture, if the cervix is fully or almost fully dilated, a snug abdominal binder is adjusted and the voluntary efforts are encouraged. This routine, which is followed in all cases, is excellent in cases of long labor as it conserves the patient's strength for the second stage. The only additional measure employed in a prolonged labor is the administration of liberal doses of morphine. Whenever the character of the contractions shows that the uterus is fatigued, sufficient morphine is given to stop the labor and allow the patient to sleep.

Nearly all women who show relative disproportion will deliver spontaneously if they are allowed a thorough test of labor.

As seventy-four of the infants in the series weighed 4,000 gm., seventy-four inductions would have been necessary if a large child had been regarded as an indication for such interference.

The large number of spontaneous deliveries occurring after a test of labor and the low infant and maternal mortality proved that cæsarean section was wisely restricted. E. L. Cornell, M.D.

Holmes, R. W., and Burdick, A. L.: The Test of Labor in Relation to Cæsarean Section: Comparative Results Obtained by Elective and Secondary Operations Based upon a Personal Experience of Ninety-Two Cases. *Am. J. Obst. & Gynec.*, 1922, iv, 179

There is comparatively little difference in the safety of operation performed in advanced labor, before the advent of exhaustion, over that of operation performed in the last days of pregnancy. The danger depends on the management of the case before and during the hours of labor. The judgment of the surgeon, the technique used, and the character of the personnel of the operating room influence the outcome as much as any adventitious circumstances incident to the labor. Within certain limits, the duration of labor is of comparatively little importance, but vaginal examinations and attempts at delivery from below are dangerous, as is also procrastinating until the vital forces are at the lowest ebb.

Prolonged rupture of the membranes offers a serious menace to the patient's welfare during the postoperative period. The woman who has a truly elective operation will have a more placid and infinitely more comfortable convalescence than a woman who has been subjected to hours of distressing labor. It is essentially true that those given the test of labor will have the same elevation of temperature as those who have the elective section, but in the former the increase will continue longer than in the latter, a fact indicating lack of resistance incident to fatigue. The longer the woman is in labor, with membranes ruptured, the higher the pulse rate and the more prolonged the elevation of temperature as compared with women not in labor or with membranes intact. Further, it is clearly evident from the study of ninety-two cases that 10 to 20 per cent of women operated upon in labor will run a more stormy course with a somewhat prolonged thermal elevation—a true, though mild septic course—especially if the membranes have ruptured, the clinical picture being distinctly worse than that in cases operated upon electively.

The danger of rupture of the uterine scar is not slight. The authors agree with the dictum, "once a cæsarean, always a cæsarean."

They have firmly adhered to the principles of the classic section with only minor deviations. Therefore, unless conditions dictate otherwise, they always eventrate the uterus through as small an abdominal cut as possible.

The following conclusions are drawn:

1. The adoption of modern surgical principles has been the most important factor in reducing the risks of cæsarean section to the present minimal point.

2. The second great factor in lowering the maternal mortality is abstinence from vaginal examinations.

3. Also of great importance in increasing the safety of sections is the routine employment of rectal touch.

4. The possibility of section should be clearly and definitely determined in pregnancy, and in every step in the conduct of labor this possibility should be borne in mind.

5. An absolute pelvic deformity demands section before labor begins and at a set hour.

6. The woman with relative disproportion should be given an adequate test of labor unless this is definitely contra-indicated.

7. The test should not be so prolonged that it causes the facies of exhaustion or an abnormal increase in the pulse rate or temperature.

8. Prolonged rupture of the membranes has a very injurious effect upon a woman in labor; if labor is unduly prolonged after the rupture a stormy convalescence is probable in 10 per cent of the cases and a fatal outcome in an occasional case.

9. If section is performed, a slow, long labor with weak and irregular contractions is not so dangerous as a shorter, but violent type of labor.

10. In all probability, a hard labor liberates protein bodies or other by-products of forced metabolism which are inimical to convalescence following cæsarean section.

11. A cæsarean section performed before labor is almost certain to be successful and associated with minimal physical distress if performed by skilled hands.

12. Labor increases the physical distress and may jeopardize the convalescence.

13. Above all things, prolonged labor with prolonged rupture of the membranes, vaginal examinations, or futile attempts at delivery from below, is disastrous.

14. Cæsarean section is far more dangerous for the woman than spontaneous labor or a somewhat difficult operative delivery.

15. The sum total of discomfort associated with cæsarean section is as great as, or greater than, the inconveniences and pain of labor.

16. Because of the facts cited and the increased mortality, section should be done only on clear indications. E. L. Cornell, M.D.

Hirst, J. C., and Van Dolsen, W. W.: Cæsarean Section: Its Indications and Technique Based on 252 Operations. *J. Am. M. Ass.*, 1922, lxxix, 294.

Following a brief summary of the indications for cæsarean section the authors state that the risks are in direct ratio to four factors: (1) the length of time the patient has been in labor; (2) the length of time the membranes have been ruptured; (3) the number and technique of vaginal examinations; and (4) previous attempts at operative vaginal delivery.

The operator must choose, to fit the requirements of the particular case, one of at least five different techniques: (1) the old classical operation with a long abdominal incision and eventration of the uterus before it is incised; (2) the classical operation with a short, high abdominal incision with emptying of the uterus *in situ* and then eventration for suturing; (3) the extraperitoneal or low cervical cæsarean section following the method of Beck; (4) the Porro operation with dropped cervical stump; and (5) the Porro operation with marsupialization and drainage of the stump.

The indications, the advantages, the disadvantages, and the technique of each type are discussed. After the operation the head of the bed should be raised 12 in. and daily vaginal douches with sterile water should be given.

The dictum "once a cæsarean always a cæsarean" is not true unless the indication is a permanent condition. Rupture occurs in subsequent pregnancies in less than 3 per cent of the cases. In the series of unselected cases reviewed the mortality was 2 per cent. Roy E. Christie, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Williams, P. F.: Postabortal Hæmolytic Streptococcæmia. *Am. J. Obst. & Gynec.*, 1922, iv, 636.

Four cases of postabortal hæmolytic streptococcus bacteræmia ending in recovery under the use of polyvalent antistreptococcus serum are recorded. Illegal instrumentation to cause abortion is considered the chief etiological factor of such infections. The dangers of non-aseptic procedures are evident from the fact that of a series of 100 women, seven were found to harbor the hæmolytic streptococcus in the cervical canal, and eleven others showed non-hæmolytic types of streptococci. A prompt diagnosis of such febrile conditions is best made by blood cultures. Cervical cultures, if they are positive and show the same organism as that recovered from the blood stream, are of value in supporting the diagnosis made from the blood findings.

Serum should be given early and in repeated doses, ranging from 50 to 100 c.cm., depending upon the clinical and laboratory findings. Reactions are the rule and vary from mild to severe chills and skin rashes. In cases of severe reactions desensitization may be necessary.

The action of the hæmolytic streptococcus on the circulating blood is not as severe as might be supposed. The cases reported showed little pelvic disease, the most noteworthy findings being slight peritonitis and parametritis.

E. L. Cornell, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Harpster, C. M., Brown, T. H., and Delcher, H. A.: Abnormalities of the Kidney and Ureter. A Case of Double Kidney and Double Ureter, with a Review of the Literature. *J. Urol.*, 1923, viii, 459.

In a few cases reported there were two kidneys on the same side, and in some there was a third ectopic kidney. Double kidneys vary from the ectopic type to kidneys composed of two parts separated by connective tissue.

In no instance were there two ureters opening from a single pelvis. The pelves are usually placed one above the other; rarely is one found in front of the other. The lower pelvis is usually larger than the upper. As a rule the portions of the kidney drained by the two ureters are unequal in size. In most cases the external form of the kidney is normal and duplication may not be suspected unless there is a distinct band separating the parts of the kidney. In some cases the ureters may run a distinct course and have double openings in the bladder, or one ureter may open into the bladder and the second into some other part of the genito-urinary tract. In other cases the ureters may come together and enter the bladder by a single orifice.

The bifurcation of the ureters may be near the kidney but is usually within 3 to 5 cm. of the bladder. When the ureters are closely associated, the ureter which drains the upper part of the kidney is posterior but may pass to an anterior position before entering the bladder.

The authors give the types of ureteral duplication as follows:

1. Unilateral duplication, complete or incomplete, depending upon whether the ureter has one or more openings into the bladder.

2. Bilateral duplication, complete or incomplete, depending upon the number of ureteral openings.

Forty cases of complete bilateral duplication were collected. There are 28 cases of incomplete bilateral duplication, 181 cases of complete unilateral duplication, and 133 cases of incomplete unilateral duplication.

The authors summarize the data of 382 cases of complete or incomplete ureteral duplication in six tables.

In the literature the authors found reports of the bifurcation of a single ureter near its lower extremity. There were a number of cases in which the supernumerary ureter opened in an abnormal situation in the bladder or extravesically. Most of the reports were autopsy reports. In a fair number of cases the condition was discovered during operation. In only a few was the diagnosis made before operation.

Improved urological methods have made a diagnosis possible in every suspected case. The authors suggest that pyelograms be made in every case in which there is the least suggestion of the condition. An abnormal organ is more susceptible to pathologic changes than a normal organ. A very large number of double kidneys show disease. In double kidneys with double ureters, hydronephrosis and pyonephrosis are very common. These conditions were found twenty-five times in twenty-nine cases in which a surgical operation was done for double kidney; 21 per cent of the operations were nephrectomies. The resection of one portion of a double kidney has been done successfully by many operators. This includes resection of a tuberculous half of a double kidney. The authors find that the diseased part of the kidney is almost always the upper part. The lower half is usually of normal shape and the ureter discharges normally.

One observer found that when the duplicate ureters have neighboring orifices the kidneys do not show visible alteration, while if one orifice opens abnormally the part of the kidney corresponding to this orifice is usually diseased.

The origin of the various anomalies is by no means clear. None of the explanations advanced to date seems to account for all types satisfactorily.

The authors conclude their article with the statement that the point of importance for practical medicine is that these anomalies occur with far greater frequency than is generally believed and therefore should be borne in mind in the diagnosis of urological conditions. GILBERT J. THOMAS, M.D.

Crabtree, E. G. The Nature and Significance of Renal Stasis. *Surg., Gynec. & Obst.*, 1922, xxxv, 733.

As a result of his investigations, Crabtree is convinced that the consideration of renal stasis from the physiological rather than the pathological point of view might reveal facts bearing on the treatment of this condition. By this he means determining whether the kidney is hampered in the elimination of urine from the pelvis rather than whether there is a dilatation sufficient to term hydronephrosis. He believes it is wrong to rely in the diagnosis entirely upon the pyelogram to the exclusion of data obtainable by the cystoscope and ureteral catheterization. As a result of such exclusion, beginning dilatations and small hydronephroses are often overlooked at a time when remedial measures can be best applied.

Crabtree defines "pelvic content" as the amount of urine present in the pelvis at the time a plugged catheter is inserted into the pelvis. "Pelvic capacity"

is indicated by the amount of fluid which can be injected into the pelvis up to the quantity which causes pain and then withdrawn; the amount withdrawn, not the amount injected, represents the capacity.

There are four types of renal stasis between the normal kidney and the large hydronephrosis: (1) acute stasis, (2) subacute stasis, (3) intermittent stasis, and (4) relative stasis.

1. Acute stasis. This condition the author believes is almost entirely an emergency condition, occurring most commonly with stone, but also following accidental ligation of the ureters, the plugging of the ureter by a blood clot during an acute attack of pyelonephrosis, and in cases in which the cystoscope was used during acute pyelonephritis. Even though the obstruction is complete it is not serious in its after-effects as the kidney generally returns entirely to normal when the obstruction is removed.

2. Subacute stasis. By this term Crabtree refers to cases of partial obstruction with back-pressure and over-dilation of the kidney continuing for a period of weeks or months. As an example is mentioned the back-pressure kidney of pregnancy. He has observed cases in which stasis of 200 to 300 c.cm. decreased to 15 c.cm. at the termination of pregnancy. Further dilatation may result, however, from the progress of the disease, without the intervention of subsequent pregnancies. Another type of subacute obstruction is that due to ureteral stone.

3. Intermittent stasis. The two most common causes of this condition are renal mobility and supernumerary vessels. Renal mobility is probably intimately associated with aberrant arteries in all cases in which pelvic stasis results. The great majority of palpable kidneys are functioning normally in spite of some degree of mobility, but the greater incidence of pyonephrosis, hydronephrosis, persistent pyelitis, and renal pain on the right side as compared with the left, in the female as compared with the male, and in the adult as compared with the child, points to significance in these anatomical differences. It indicates also that renal damage is a progressive condition.

4. Relative stasis. By this is meant apparent obstruction to the outflow of urine. This condition may be present without symptoms. The function of the kidneys is usually good, and there is no thinning of the cortex indicating serious back-pressure. The ureterovesical valve is often competent, and the injection of fluid into the bladder results in its regurgitation into the kidney pelvis. The condition is probably congenital. HERMAN L. KRETSCHMER, M.D.

Barney, J. D.: The Question of Recurrent Renal Calculi. *Surg., Gynec. & Obst.*, 1922, xxxv, 743.

The author calls attention to the paucity of the literature on recurrent renal calculi. This subject is unpopular because of the long and patient labor which the accumulation of data involves, and because of the disappointing results revealed by the investigation. Barney believes that in studying these cases it is necessary to examine the patient personally, the patient's statement by word or letter being insufficient.

The recent investigation of cases in the Massachusetts General Hospital showed unsatisfactory results. Of seventy cases of nephrotomy, the results are known in thirty-five. Of sixteen cases in which a roentgen examination was made, fourteen showed the presence of stone on one or both sides. These figures would be greater if all cases had been checked up by the X-ray. Many were unquestionable cases in which stones were left at operation. Of the cases of stone admitted to the hospital, sixteen had been previously operated upon for renal calculi, and of this number, twelve (75 per cent) had been operated upon on both sides.

In a recent investigation regarding recurrences postoperative roentgenograms were made in twenty cases. In nine (45 per cent), the films showed a stone still remaining in the kidney. In the absence of such postoperative roentgenograms, which clearly demonstrate the author's point that stones are frequently overlooked during operations, these stones would have been recorded as recurrences if found at a later date.

The various causes responsible for failure to remove all of the stones, and the aid given by the fluoroscope at the time of operation are discussed. The author's conclusions are as follows:

1. As there has been little investigation regarding recurrent or overlooked renal calculi, it is desirable that various observers in different clinics undertake such an investigation.

2. A roentgenographic examination made during or very shortly after convalescence is essential for the accuracy of the results in such study.

3. While the few data at hand show that stones are found in the kidney after operation in a surprising number of cases, it is impossible to state which of these stones are recurrences and which are stones left at operation. Unquestionably recurrence is very frequent.

4. The complex character of the interior of the kidney, hæmorrhage from its mucosa, and the comparative inaccessability of this organ in many cases contribute to the difficulty of removing all stones.

5. Although various procedures may be resorted to for this purpose, none is infallible. It would appear that the fluoroscope offers the most promising prospects for success.

6. Pre-operative study cannot be too painstaking, nor must the possibility of superimposed shadows of calculi be overlooked.

7. A second operation for the removal of remaining stones is advisable in most cases and should be done soon after the first operation.

8. Pyelotomy is unquestionably the operation of choice and is often advantageously combined with partial nephrotomy.

HERMAN L. KRETSCHMER, M.D.

Hofer, O.: Obstruction of the Common Bile Duct and Anuria Due to a Solitary Cyst of the Kidney (Gallenblasenverschluss und Anurie durch Solitärcyste der Niere). *Münchn. med. Wchnschr.*, 1922, lxix, 1279.

Solitary cysts of the kidney are rare. Their symptoms are usually slight but they may cause severe disturbances by pressing upon the excretory urinary passages or the neighboring organs. Hofer reports a case in which a tumor the size of two fists in the right upper part of the abdomen of a woman 36 years old proved at operation to be a solitary cyst of the kidney. This growth had caused displacement and torsion of the right kidney and ureter, and through pressure upon the excretory biliary passages was responsible for the development of chronic icterus. KOHNS (Z).

Oehlecker, F.: The Partially Transperitoneal and Partially Extraperitoneal Operation on the Kidney: Extraperitoneal Operation After Diminution of the Peritoneal Sac (Die teils transperitoneale und teils extraperitoneale Nierenoperation: extraperitoneale Operation nach Verkleinerung des Peritonealsackes). *Zschr. f. urol. Chir.*, 1922, x, 52.

Transperitoneal nephrectomy leaves behind a wall extending through the peritoneal cavity which may give rise to incarceration of the intestine. With the author's modification of the operation this septum in the abdominal cavity is avoided and the abdominal space is somewhat diminished. Before the true kidney operation is performed the abdominal cavity is completely closed by suturing the parietal to the prerenal peritoneum on the medial side. The operation is then performed without entering the peritoneum. Lumbar drainage is instituted.

This operation is recommended especially for cases in which the kidney is in an abnormal position and for obscure cases. It is begun with a pararectal incision. FRANCKENSTEIN (Z).

Furniss, H. D.: Supernumerary Ureters with Extravesical Openings. *J. Urol.*, 1922, viii, 405.

Duplication of the ureter is a very common malformation but a supernumerary ureter with an extravesical opening is rare. A review of the literature shows that fifty-one cases of this malformation have been reported up to the present time.

Of the several theories advanced to explain the double ureter the most plausible is that there are two separate evaginations from the wolffian duct. In the process of downward growth the lower ureter reaches the bladder first, usually where the normal ureter is found, while the upper ureter continues its downward shifting with the wolffian duct, mesial to the first attached ureter, until it reaches the urogenital sinus. The wolffian duct without the ureter continues to shift to a still lower level. If the two ureters are liberated in quick succession they will be found close together in the bladder, but if they are liberated at different times they will be farther apart so that the upper ureter may be carried even to or below the internal urethral orifice. The practical points learned from this embryological study are:

1. A double ureter may unite at any point between the bladder and the kidney and empty into the bladder as a single tube.

2. When there are two separate openings the two halves of the ureter are distinct in their course to the bladder.

3. The ureter opening most caudad comes from the cephalad portion of the kidney, and that from the lower pole occupies the normal position in the bladder.

4. When the ureter opens into the urethra, the urethral opening is always on the floor.

5. When the ureteral opening is in the vagina it is on the anterior wall and never on the lateral wall.

6. The ureter emptying lowest crosses and lies to the inner side and behind the more normally situated ureter.

7. In the female, the ureter may empty into the vagina, the vestibule of the vagina, fallopian tube, uterus, or Gaertner's duct.

Wherever the opening, the lower end of the ureter has usually been dilated, either as a small sac or as a fusiform swelling. In many instances this dilatation extended to the kidney which was found to be atrophic in the part drained by the supernumerary ureter.

The usual history given is that of constant dribbling night and day since birth, in addition to normal voiding. In a few patients control is fairly good, but is occasionally weakened by child-bearing. It is noteworthy that in most instances the condition remains unrecognized until adult life. Often this is due to the fact that the renal tissue drained by the abnormally placed ureter is almost inactive and puts out urine as well as dyes very feebly. When the condition is suspected and simple inspection does not reveal the opening, the patient should be given indigo-carmine intravenously and pledgets of cotton should be placed in the urethra and vestibule. If sufficient dye is excreted the stained spot will give a clue to the location of the opening. If this procedure fails, the patient should be given three or four 1-gr. doses of methylene blue and re-examined the next day. Endoscopy will locate the orifice in the urethra. In the X-ray plate the upper portion of the kidney may be found irregular in contour, and in the pyelogram the upper calyx may be missing if the kidney had two pelves.

In the cases reported the following operations have been done: (1) ligation, (2) anastomosis of the dilated end of the ureter and the bladder, (3) implantation of the ureter into the bladder, and (4) resection of the upper pole of the kidney. For cases in which a considerable amount of renal tissue is drained by the accessory ureter the author advises a ureterovesical anastomosis. If very little renal tissue is drained by the accessory ureter and there is no

dilatation and no infection, ligation is advisable, while in cases with dilatation, infection, and a small amount of renal tissue resection is the best procedure.

Furniss reports the following cases:

Case 1. The patient was a girl 19 years old who voided normally but complained of constant dribbling of urine. A cystoscopic examination after the injection of indigo-carmine showed the dye passing from normally situated right and left ureters. Cotton packed in the vestibule was soon found stained just below the meatus. A ureteral catheter inserted for 4 in. was found on vaginal palpation to pass to the left side. After catheterization an attempt was made to dissect the ureter out and turn it into the bladder. An incision was made through the ureteral and vesical mucosa and an anastomosis effected with catgut. The distal end of the ureter was ligated, and a retention catheter placed in the bladder. Seven days after the operation the leakage recurred. At a secondary operation performed three weeks later the ureter was mobilized for a distance of ¾ in., a sound passed into the urethra to the bladder and out of the opening for the anchoring of the ureter, and the ureter pulled into the bladder by withdrawing the sound, and secured with chromic catgut. This ureter functioned for only six months, but the incontinence was cured.

Case 2. The patient was a woman 38 years of age who had a history of incessant dribbling and normal micturition. Cystoscopy showed two normally placed and functioning ureters, but the extravesical ureteral opening could not be found. A supravaginal hysterectomy was done for a large fibroid of the uterus. On the right side of the pelvis was a soft, elastic, extraperitoneal swelling ¾ in. in diameter, which extended over the brim of the pelvis. Palpation of the right kidney showed a mass the size of a hickory nut on the superior pole. A right rectus transperitoneal exposure of this kidney showed the dilated ureter in front of the other ureter and closely connected with it. The ureter was clamped and cut 3 in. from the pelvis; its lower end was ligated and dropped and its renal end dissected up to a mass about ¾ in. in diameter on top of the kidney proper. This mass, which was resected without difficulty, proved to be a sac with only a trace of renal tissue. The operation was followed by uneventful convalescence with complete relief of symptoms.

C. D. Holmes, M.D.

Laurie, T. F.: Report of a Case of Extreme Dilatation of the Ureters. *J. Urol.*, 1922, viii, 491.

The patient, a man 37 years of age, complained of frequency of urination with occasional burning which had begun ten years ago and had become increasingly worse. At the time he consulted the author he voided every two hours during the day and every two hours during the night. With this frequency there was some urgency.

At the age of 2½ years the patient had had infantile paralysis causing atrophy of the muscles of the back and abdomen, and of the right leg and thigh. At the age of 14 scoliosis of the lower dorsal and the lumbar spine with slight rotation developed.

At examination neither kidney was palpable. The prostate was flat and not tender, and the vesicles were not palpable. The capacity of the bladder was 4 oz. There was no residual urine. The vesical mucosa was smooth and glistening. At the apex of the trigone there was slight congestion. The ureteral orifices were much enlarged, the right appearing about 1 cm. across and the left about half that wide. Catheters could be easily passed to the kidneys.

On account of the dilation of the ureteral orifices it was evident that fluid introduced into the bladder would go to the kidneys. The cystoscope was therefore removed, the bladder was filled with sodium bromide through a catheter and a cystouretero-pyelogram was made.

Smears and animal inoculation proved the absence of tubercle bacilli in the urine. A very small amount of pus was found in only one specimen.

Dilation of the ureters may be due to congenital or acquired mechanical causes, infection, and disturbances of innervation. In the case reported there was no evidence of obstruction at any point in the urinary tract. It is possible that the dilation of the ureters and pelves and the contraction, rigidity, and thickening of the bladder wall were the result of a severe infection at the time of the first urinary symptoms. A disturbance of innervation must be considered as a very probable etiological factor, but lack of knowledge regarding the innervation and mechanism of urination prevents certainty on this matter. While it is known that the urinary tract is affected in infantile paralysis, the exact nature of the involvement is not known. It is possible that the ureterovesical valve was affected to the point of insufficiency as this would explain the symptoms.

C. D. Holmes, M.D.

Richter, J.: A Case of Cystic Enlargement of the Vesical Extremity of the Right Ureter and Its Treatment (Ueber einen Fall von cystischer Erweiterung des rechten vesicalen Harnleiterendes und ueber ihre Behandlung). *Ztschr. f. urol. Chir.*, 1922, ix, 219.

Cystoscopy was performed on a woman 29 years of age for persistent cystitis. A cystic enlargement of the vesical extremity of the right ureter was discovered, the primary cause of which was stenosis of the ureteral orifice probably due to inflammation.

The wall of the cyst was removed by high section and the ureter sutured. Histologic examination showed that the musculature of the bladder continued into the cyst wall.

An ascending nephropyelitis made a second operation necessary later. The transvesical method of operation is preferred by the author to the intravesical operation because it gives quicker results.

Ruge (Z.).

Aschner, P. W.: Primary Tumors of the Ureter. *Surg., Gynec. & Obst.*, 1922, xxxv, 749.

Forty-seven cases of primary epithelial tumors of the ureter collected by the author are grouped as follows: (1) papillomata, twenty-one; (2) papillary carcinomata, twelve, and (3) non-papillary carcinomata, fourteen.

In four of the cases of Group 3 the growth was a squamous-cell carcinoma, and in ten, a carcinoma solidum seu medullare. The author reports a case of combined squamous-cell carcinoma and leucoplakia. Kretschmer has collected forty-four cases of leucoplakia of the urinary tract.

The author's patient was a man 38 years of age. X-ray examination three weeks after the onset of symptoms showed four shadows in the right kidney region. The urine showed pus and a few red blood cells. Urine from the right ureter showed a large quantity of pus and a 0.3 per cent urea content. There was no excretion of indigo, and bacterial cultures were negative. The urine from the left ureter was clearer and more concentrated. Indigo was excreted in twenty-five minutes. The urea content was 0.9 per cent. Bacterial cultures were negative. A pyelogram was not made because of the patient's poor general condition.

Thirty per cent of phthalein was excreted in two hours. Analysis of the blood showed urea nitrogen 26.6, incoaguable nitrogen 74.7, uric acid 4.1, and creatinin 2.4. The Wassermann test was negative.

At operation the right kidney was found to be twice its normal size. The greatly enlarged pelvis was opened and three stones and several masses of fibrinous exudate were removed. The fourth stone was removed through the cortex.

The thickened and strictured ureteropelvic juncture was incised and a section removed for examination. On culture, the fluid in the pelvis yielded hæmolytic streptococci. Section showed squamous-cell carcinoma. Six days later the kidney and ureter were removed by the technique described by Beer.

When the kidney was split, the pelvis was found to be bifid. The lower part showed leucoplakia. At the ureteropelvic juncture the tumor was circular and 1.5 cm. in length. Subsequently radium treatment was given for leucoplakia of the bladder. The patient did not react well and died of uræmia soon afterward.

The diagnosis of ureteral tumors is difficult. If the tumor is visible, and if bleeding occurs from the ureter during the cystoscopic examination, the diagnosis is fairly certain. A ureterogram may be of aid when the tumor is not visible. Stricture and calculus must be excluded. If the urine above a bleeding obstruction is clear, it is suggestive. The persistence of hæmaturia after the removal of a tumor of the bladder is also suggestive. In only four cases in which the tumor was concealed was the diagnosis made before operation.

C. D. Pickrell, M.D.

BLADDER, URETHRA, AND PENIS

Schwarz, O.: Investigations of the Physiology and Pathology of Bladder Function: Remarks on the Pathology of the Vesical Neck (Untersuchungen ueber die Physiologie und Pathologie der Blasenfunktion; zur Pathologie des Blasenhalses). *Ztschr. f. urol. Chir.*, 1922, x, 167.

Dysuria and retention may be present when the prostate is of average size or smaller and though it is normal in structure and shows no signs of inflammation. In such cases a mechanical obstruction to the outflow of urine is ruled out but the enucleation of the gland gives complete relief. The author explains this fact by the assumption that small nodes of adenoma exert a tonic irritation upon the sphincter which then becomes the immediate cause of the disturbance of function, just as an ulcer near the pylorus continues the pyloric spasm. The importance of the middle lobe as a cause of mechanical obstruction is greatly overestimated.

The author distinguishes three types of cases of contracture of the neck of the bladder. In the first type there is a deposit of newly formed connective tissue immediately under the mucous membrane, which forms a fibrous tight ring around the orifice. The etiology is unknown, but there is neither a prostatitis nor a connective tissue infiltration of the sphincter. The second type is characterized by pronounced chronic inflammatory infiltration of the glandular and muscular tissues in addition to the other changes mentioned, the bladder exit being transformed into a rigid tube and the mobility of the sphincter limited. In cases of the third type there is hypertonia of the sphincter, but the urethra is easily passed by the thickest instruments. This is a permanent hypertonia of the sphincter similar to that which often persists after spinal disease.

The treatment of all of these forms is stretching or the incision or excision of a segment of the sphincter by the transvesical route. This operation is always successful. As frequently the colliculus can be easily made visible in the cystoscope when the bladder is entirely normal, the conclusion may be drawn that this phenomenon has no relationship to relaxation of the sphincter, but may be produced in every case by the cystoscope as a reflex excitation of the sphincter. The free communication of the posterior urethra with the bladder is a functional phenomenon; it is not permanent but persists during the examination. By lowering the cystoscope it is possible, after waiting for some time, to illuminate the posterior urethra for a considerable distance and thus to bring the colliculus into view. The cystoscope exerts an irritating action upon the sphincter, causing it to relax.

Von Tappeiner (Z).

Kretschmer, H. L.: Elusive Ulcer of the Bladder; A Further Report. *Surg., Gynec. & Obst.*, 1922, xxxv, 759.

Kretschmer has added nine cases of elusive ulcer of the bladder to his series, making a total of fourteen. He has reviewed all of his cases to determine

whether the treatment given is justified by the end-results.

The etiology of the lesion is still vague. Of 118 cases collected, including Hunner's fourteen, only twenty-nine were those of males. Twenty-three of the latter were reported by Frontz. Five of the author's patients had never borne children. Their ages ranged from 24 to 60 years. Thirteen had had previous surgical operations, nine of which were for the urinary symptoms. The duration of the symptoms ranged from eleven months to seventeen years. All of the patients were thoroughly examined for infections in other parts of the body.

Of the symptoms, two were noted in every case, namely, frequency and pain. The pain was constant or present only during micturition. Hæmaturia was present in six cases and was increased when the bladder was over-distended. Urgency, burning, tenesmus, and backache were variable symptoms.

In thirteen of the fourteen cases accurate records of the urine were obtained. The urine was normal in only one. In seven cases it contained pus. In five cases the urine from both kidneys was sterile, while in three only that from one kidney was sterile. In the others, cultures showed the presence of bacillus coli, streptococci, staphylococci, or diphtheroid bacilli. The diagnosis was made by exclusion.

Sections made of all tissue removed confirmed the diagnosis. The mucosa and submucosa were chiefly involved, the muscle very little.

In one of the eight cases operated upon, a recurrence developed, and in another the urine again showed pus and staphylococci. Two patients were freed of symptoms by fulguration, two are no longer under observation, and two are improving without treatment. C. D. PICKRELL, M.D.

GENITAL ORGANS

Felber, E.: Experiences with the Perineal Operation for Prostatic Abscesses and Prostatic Stones (Erfahrungen mit der perinealen Operation der Prostataabscesse und Prostatasteine). *Zischr. f. urol. Chir.*, 1922, ix, 390.

The author reports on the perineal operation in twenty-nine cases of prostatic abscesses and four cases of prostatic calculi (associated twice with vesical calculi). One of the abscesses was tuberculous, twelve were gonorrhœal, five were metastatic abscesses (one due to the colon bacillus), one was a pure staphylococcus abscess in gonorrhœa, eight were abscesses in the hypertrophied prostate following a serious infection of the urinary tract, and three were abscesses following operations for hæmorrhoids. The perineal operation was done twenty-seven times and the vesical operation twice.

Twenty-seven cases were cured. One patient died and one result is unknown. The rectum was never injured when the perineal route was used. The fact that this operation is done under direct vision justifies its recommendation. Prostatic stones are also easily removed by the perineal route.

LOHR (Z).

Legueu: Infections of Prostatic Adenomata (Les infections de l'adénome prostatique). *Arch. d. mal. d. reins et d. organes génitaux-urinaires*, 1922, i, 129.

In the past years Legueu has seen several cases in which the patient showed symptoms of acute retention which were followed in a few weeks by the development of an abscess. A perineotomy was done, but as this did not put an end to the complications arising from the urinary retention, Legueu was obliged to perform a prostatectomy in one or two stages. The cause of the retention was infection of a prostatic adenoma.

Infection of a prostatic adenoma occurs in the aged. It differs from gonorrhœal infection in young persons. Gonorrhœal abscesses evolve in the prostate itself or its immediate neighborhood, the glands being the point of origin. In the aged, a pre-existing adenoma becomes infected as the result of a general systemic infection.

On section the extirpated adenoma shows greenish spots, and drops of pus may be expressed from it. On bacteriological examination various organisms may be found. Two of Legueu's recent cases showed staphylococci.

A common type of case is one in which there is acute retention but the suppuration remains intracanalicular and localized to the interior of the adenoma. A small induration, the localized abscess, can be felt through the rectum. The only acute phenomena are fever and retention.

Clinically the only difference between a young patient with suppurative prostatitis of gonorrhœal origin and an aged patient with adenomatous prostatitis is that the first may recover completely after evacuation of the suppuration and suffers acute retention for only a few days, while the second will not recover, and retention will persist because the neck of the bladder is definitely and permanently altered.

The incidence of suppuration in adenomata removed by Legueu was as follows: adenomata weighing less than 20 gm., suppuration in one-sixth; adenomata weighing between 30 and 50 gm., suppuration in one-fourth; adenomata weighing between 50 and 100 gm., suppuration in three-sevenths; and adenomata weighing above 100 gm., suppuration in one-fourth.

Infection of a prostatic adenoma is indicated by fever and inequality, incrustations, or indurations in the prostate. Nothing suggests a cancer of the prostate more than inflammation.

Legueu outlines the surgical procedure which he prefers in different types of cases. Whenever there is infection of an adenoma, especially a small adenoma, there are extensive adhesions which render operation very difficult. W. A. BRENNAN.

Gaulden, C. L.: Traumatic Dislocation of Both Testicles. *California State J. M.*, 1922, xx, 190.

In a search of the literature Gaulden was able to find only five cases of traumatic dislocation of the testicles.

The case reported in this article was that of a man 32 years of age, the father of three children. While at work as a brakeman on a log train the patient was thrown from the car and pinned between two logs which compressed his abdomen and broke both bones of his right leg in their lower third. Complaint was made only of pain in the groins and the scrotum. In the region of the inguinal canal on both sides masses could be felt which were very sensitive to the touch. The scrotum was enlarged and discolored but without external marks of injury. The testicles had been forced from the scrotum into the inguinal region.

The patient was treated expectantly. On the third day the right testicle was replaced by manipulation without anæsthesia but the replacement of the left required the use of ether. The veins of the cord were lacerated and thrombosed but the epididymis and vas were not injured. The patient made an uneventful recovery. Louis Gross, M.D.

Sheldon, J. G., and Heller, E. P.: A Congenital Defect of the Anterior Abdominal Wall and Cryptorchidism; Report of a Case. *J. Missouri State M. Ass.*, 1922, xix, 493.

The patient was a man 24 years of age. Examination revealed a swelling in the right lower quadrant, tenderness in the left groin, and absence of the testicles from the scrotum. An oblique incision was made over the swelling and in the direction of the fibers of the external oblique muscle. The fibers of the external oblique, the rectus, the conjoined tendon, and the internal oblique were found attenuated. The appendix was removed as it showed evidences of disease. The atrophic right testicle was discovered behind the cæcum in the retroperitoneal structures. By dividing all the structures except the vas and its artery the testicle was placed in the upper part of the scrotum. The inguinal canal was then closed as in the Ferguson operation, and the abdominal muscles were overlapped and sutured. Except for a little drainage, healing was uneventful.

As this operation consumed considerable time, the replacement of the other testicle, which was palpated in the inguinal canal, was left for a later operation.

C. D. Pickrell, M.D.

Lichtenstern, R.: The Clinical Aspect and the Treatment of Cryptorchidism (Zur Klinik und Therapie des Kryptorchismus). *Zentbr. f. urol. Chir.*, 1922, ix, 185.

The author has found absence of spermatogenesis in every case of cryptorchidism in adults. As the endocrine function of the testicles also suffers more or less in the course of time, the development or maintenance of the secondary sexual characteristics is endangered (Tandler and Gross, Kyrle, Lichtenstern). Condray and Glannan have shown that the condition can be remedied by early transference of the testicles to the normal position.

On the basis of his own observations, Lichtenstern recommends the correction of bilateral cryptorchidism in childhood. The operation which has given the best results is bilateral fixation of the spermatic cord by means of sutures passed through only the sheath. The best time for the operation is between the eighth and tenth years. Pflaumer (Z).

Bowing, H. H.: Radium and Roentgen-Ray Treatment in Metastatic Testicular Tumors. *J. Radiol.*, 1922, iii, 319.

Since 1917, more than thirty patients with testicular tumors have been given radium and deep roentgen-ray treatment at the Mayo Clinic. The majority came with a diagnosis of primary sarcoma of the testicle, and a few with a diagnosis of carcinoma. Most of the diagnoses were based on microscopic examination. The patients were either in good health or markedly underweight and weakened.

The duration of the disease seems to be of more importance than the size of the tumor. When the patients were seen at the Clinic it was not difficult to determine the chief reason for their complaints and to diagnose metastatic testicular tumor. Most of them stated that they had had a testicular tumor removed but that in the course of a few months they developed severe pain in the back, referred down the legs, and some weeks later discovered an abdominal mass.

Given a patient who had a primary tumor of the testicle removed and within a few months complained of symptoms in the upper abdomen, and a few months later noted an abdominal tumor, a therapeutic test of one intensive radium treatment may make the diagnosis in seven to ten days. If the tumor is testicular in origin, it will decrease in size.

The treatment is practically the same for patients with fair or good health and those with poor health. To all patients who will live a month or six weeks, intensive treatment should be given. The early cases reviewed were inadequately treated. The records show that a course of from 2,000 to 4,000 mgm.-hrs. of radium was outlined and that one or two areas were exposed to roentgen-ray therapy. The patients were instructed to obtain further treatments at home, but in only a few instances was this done. In many of the cases the metastatic tumors have disappeared under treatment. The patients seemingly are in good health and have returned to their various activities. Their chance for a more lasting arrest of the disease should be greater than that of patients treated in the earlier series.

In the radium and roentgen-ray treatments the region of the growth is mapped out into areas measuring 3 by 4 cm. and 4 by 6 cm., the number of areas depending on the time of treatment. The first areas treated are small, and when the treatments are repeated the size of the area is increased in order to cut down the possibility of over-irradiation of the tissues due to scattering. Fifty or 100 milligrams of radium are applied to each area at a distance of

2.5 cm. The radium is applied in universal tube applicators with walls of 0.5 mm. of silver and extra filtration, 2 mm. of lead and 2 mm. of rubber. If the body surface to be irradiated is large (from twenty to thirty areas), the amount of irradiation for each area ranges from 700 to 1,000 mgm.-hrs. If there are less than eight or ten areas, 1,000 mgm.-hrs. are delivered to each unit. The supraclavicular glandular enlargements are packed with radium. The tumor may be divided into two to four areas. The adjacent skin surfaces are protected with lead and rubber. The number of radium treatments varies. In some cases one treatment causes the metastatic tumors to disappear, while in others two to four treatments at intervals of six to eight weeks are necessary.

The present technique takes advantage of the newer ideas of deep therapy. The current is sent through a broad focus standard Coolidge tube. In the first treatments, practically the entire lymphatic system is exposed in an attempt to decrease the enlargement and destroy any metastatic nodules. The abdominal area exposed to radium is not treated with the roentgen ray. The adjacent abdominal and lateral walls are mapped out into areas measuring approximately 10 to 15 cm. The supraclavicular spaces, axillary spaces, and inguinal glandular areas are mapped into areas sufficiently large to insure thorough irradiation. The formula used at present is: spark gap, 23 to 24 cm.; distance of skin target, 30 cm.; milliamperage, 5; filtration, 6 mm. of aluminum and a layer of sole leather; and time, fourteen minutes. The cross-fire principle is used.

The patient should be examined at intervals of two months. If no tumor is palpable, treatment should not be resumed. Most patients require from two to four treatments and then a rest of from three to four months. When the physical and roentgen-ray findings are negative it is safer to treat the symptoms than to wait until a demonstrable growth develops. Lumbar pains are usually indicative of enlargements of the deep lumbar glands.

All patients having large or small metastatic tumors but good to fair health are given intensive irradiation regardless of the pathologic report. Treatment with Coley's mixed toxins is not advised when the case is first seen, but may be considered if the case proves refractory under radium and roentgen-ray therapy.

These patients undergo a general reaction as well as a local reaction typical of all cases treated with radium and the roentgen ray, viz., anorexia, nausea, vomiting, and weakness. If the reaction is not too severe, the treatment is continued. As a rule, four to six blocks are applied at one time, this being repeated on consecutive days until all the areas have been exposed. If treatment is too severe, however, irradiations are omitted a few days until the patient's condition improves. For proper interpretation of the reaction, the complete radium treatment must be given and then followed by the roentgen-ray treatment. ADOLPH HARTUNG, M.D.

MISCELLANEOUS

Pflaumer: Accurate Chromocystoscopy [Exakte Chromocystoskopie] *Ztschr. f. urol. Chir.*, 1922, x, 245.

The author injects intravenously only 0.01 to 0.02 c. cm. of indigocarmine in 4 to 5 c. cm. of water. The first blue color appears after two and one-half to four minutes and the greatest concentration is reached after five minutes. A careful cystoscopic examination to determine the position of the ureteral openings and possible deviations from the normal must precede the injections. During the observation the beginning of the appearance of the blue color, the greatest concentration, the diminution in the color, the length of the intervals between the spurts of urine, and the extent and force of the spurts must be carefully noted with the aid of a stop-watch. The examination should be made first on the normal kidney and immediately afterward on the diseased kidney, because the phenomena following an intravenous injection are crowded together into a relatively short space of time. A darkened room and a cystoscope with a strong light are prime requisites for the test, and the findings should be controlled by a second observation. EHRLICH (Z).

Eisendrath, D. N.: Calculous Anuria: Report of a Case. *J. Am. M. Ass.*, 1922, lxxix, 2057.

Calculous anuria may result from: (1) obstruction of both kidneys or ureters by calculi; (2) obstruction of one ureter and loss of function in the other kidney due to disease, congenital deformity, or reflex inhibition of secretion; and (3) obstruction of the remaining kidney after nephrectomy. The following case is of the third type.

The patient, a woman aged 34 years, had had periodical attacks of pain for eight weeks. The X-ray showed two small shadows within the right kidney shadow, and one in the left. A pyelogram of the right side confirmed the diagnosis of stone. The urine from the right ureter contained a larger number of leucocytes than that from the left, and phenolsulphonephthalein was excreted in greater quantity and sooner from the right ureter than from the left.

The stone in the right pelvis was removed through a pyelotomy incision and the second stone, which was found in the parenchyma, removed through a nephrotomy incision. On the sixth day severe renal colic on the left side caused symptoms of shock. Roentgenograms were not satisfactory. During the following twelve hours 8 oz. of urine were voided. The next day a cystoscopic examination showed only a few drops in the bladder. The right catheter drained 10 c. cm. in three hours. The left ureter was completely blocked about midway to the pelvis.

Through an incision in the lumbar portion of the left ureter a large impacted calculus was delivered. The urine then increased in amount, reached 2,070 c. cm. on the fourth day. Except for local infection, recovery was uneventful. C. D. PICKRELL, M.D.

Walker, J. T.: The Relation of Calcified Abdominal Glands to Urinary Surgery. *Lancet*, 1924, cxcii, 1213.

During the past few years Walker has examined forty-two cases of urinary disease or supposed urinary disease in which calcification of abdominal glands was found. Calcified glands represented the final stage of tuberculosis of the mesenteric glands, a disease common in children. The literature refers almost exclusively to the active stage of the disease as it occurs in early life. Next to tuberculosis of the bronchial glands, tuberculous infection of the mesenteric glands is the most frequent cause of disseminated tuberculosis.

In the majority of the cases studied one or two groups of glands were affected. Those most frequently involved were the group lying in the lower part of the abdomen on the right side, but in some cases the glands in the upper part of the abdomen on the left side showed the condition.

Reference is made to the anatomy of the abdominal lymphatics. In 71.5 per cent of the author's cases the glands involved belonged to the ileocolic group, and in 15.8 per cent, to the mesenteric group. With the exception of three cases, clinical examination revealed no focus of tuberculosis elsewhere, a fact which suggests that infection of the mesenteric glands may be the source of renal infection. The chief interest in calcified abdominal glands from the standpoint of urology lies in the diagnosis and treatment.

In a number of the forty-two cases other pathologic conditions were present in addition. There were seven cases of stone in the kidney or ureter, two cases of pyelitis, and three cases of urinary tuberculosis. One woman was pregnant. In twenty-eight cases no other disease besides the calcified abdominal glands could be detected. In these twenty-eight uncomplicated cases the chief symptom was pain; in twenty-five the pain was a prominent feature, in four a dull ache, in fourteen an abdominal colic, and in seven moderately acute.

The duration of the pain varied from a few minutes to several hours. It was sudden in onset and usually ceased suddenly. In severity it was comparable to renal and biliary colics and much more severe than the pain of appendicitis. In distribution it resembled moderate renal or ureteral colic in seventeen cases, the pain of appendicitis in four, and biliary colic in one. In five cases it was not defined, and in one there was no pain. Movement had practically no effect in initiating or increasing the pain. Vomiting did not occur. There was no retraction of the testicle and no pain referred to other parts of the body. Disturbance of bowel action was rare. Tenderness was present in four cases. As this was within the appendix area, it was a confusing sign. The author attributes the pain to ureteral spasm caused by the drag or pressure of the calcareous mass.

Blood was present in the urine in six cases in which no other abnormal condition than the gland calcification could be detected. In one case there was severe intermittent hæmaturia for eight years as the only symptom. The details of this case are given. Removal of the calcified gland was followed by cessation of the bleeding and restoration to health. The author's experience leads him to believe that there was some relationship between the calcified glands and the hæmaturia.

The differential diagnosis between the shadows cast by renal and biliary calculus and calcified glands is discussed. Pyelography and lateral radiography combined with pyelography are the best means of differentiating these conditions.

The calcified glands were removed in eleven of the forty-two cases, and in every instance the operation relieved the pain. Such surgical treatment is justified, however, only when the symptoms are severe and due directly to the calcified glands. A paramedian incision is made to the right or left of the umbilicus and care is taken to avoid injury to the superior mesenteric artery and its branches and the numerous veins adhering to the glands.

H. A. Fowler, M.D.

SURGERY OF THE EYE AND EAR

EYE

Pascheff, C.: Preliminary Communication on Injury as a Cause of Diabetes Insipidus with Bitemporal Hemianopia. *Brit. J. Ophth.*, 1922, vi, 549.

During the World War four cases of wounds involving the chiasm came under the author's observation. One of these is reported particularly because of the development of diabetes. This case was that of an officer wounded over the right eyebrow March 22, 1917, by a bomb explosion and unconscious for twenty days following the injury. In the course of a month the following symptoms were observed: bitemporal hemianopia, diplopia, polydipsia, polyuria (from 4.5 to 9 liters in twenty-four hours), loss of hair, loss of sexual desire, anhydrosis, staggering gait, marked asthenia, anosmia, deafness of the left ear, and loss of sensation with absence of the reflex of the right cornea. Vision was 6/24 in the right eye and 6/9 in the left.

The patient remained under observation for three years. Treatment by electricity and injections of pituitary gland caused improvement in his condition; he became stronger and able to walk well but the bitemporal hemianopia, labyrinthine deafness, and polyuria remained unimproved. The coincidence of bitemporal hemianopia and diabetes insipidus as the result of injury is explained by the assumption that the shock of the injury was conveyed from the right eyebrow to the sella turcica and left petrosal bone, thus causing a lesion of the chiasm, the hypophysis, and the left labyrinth.

JAMES P. FITZGERALD, M.D.

Doub, H. P., and Carter, J. M.: An X-Ray Demonstration of the Nasolachrymal Passageways—Normal and Obstructed. *J. Radiol.*, 1922, iii, 521.

In order to determine the operation of choice in any given case of obstruction of the nasolachrymal passageways, the authors have been using the roentgen ray to obtain a picture of the lumen of the passageway.

An attempt is made first to syringe solutions through the sac and duct into the nose by way of the puncta. This having been done, the passageway is injected with Beck's bismuth-and-oil paste, about 1 c.cm. being used in cases without obstruction, and one-half that amount in those with obstruction.

The localization of the obstruction with respect to the surrounding structures is aided by placing a small silver rider over the anterior end of the middle turbinate just below its attachment to the lateral nasal wall. Another method of considerable value consists in outlining the position of the anterior end of the middle turbinate with a strip of bismuth paste. This is easily accomplished by means of a long lachrymal needle. A roentgenogram made in the lateral position will then show how much of the unobstructed passage lies above or below the root of the turbinate and whether the obstruction is in front of the turbinate or behind it.

Following the injection, roentgenograms are made of this region from several angles. The positions which have been found best are the frontal, true lateral, Waters-Waldron, and an oblique modification of the Walters-Waldron.

During the last twenty months the nasolachrymal passages have been studied in about eighty persons, including normal persons and those with obstruction. In the normal persons a number of variations from the generally accepted normal have been found. In some of them the passageway was very tortuous and showed considerable variation in its lumen. Moreover, while usually the sac and duct are joined end-to-end, there were several cases in which a side-to-side union was found.

Of the cases with definite obstruction a portion of the sac was very much dilated in some, and in others the sac was very small because of abscess formation followed by scar-tissue contraction. All grades between these conditions were seen. In a number of cases with symptoms of partial obstruction there were areas of constriction which caused obstruction only when a considerable quantity of lachrymal fluid was secreted.

The roentgen plate has been of value in several postoperative conditions. In cases in which a short-circuiting operation into the middle fossa of the nose has been performed, the exact size of the opening can be noted by this means and a fairly accurate prognosis made as to permanent relief of the symptoms. A number of patients subjected to operations for the removal of the sac later complain that they are able to express pus from the lachrymal fossa. The X-ray shows definitely whether the sac has been removed *in toto* or in part, and if the latter is the case, how much of the sac remains and its condition. This information is of great value to the surgeon in determining whether enough of the sac is left in place to make feasible a short-circuiting operation into the nose or whether it would be better to remove the remaining portion.

ADOLPH HARTUNG, M.D.

Woods, A. C., and Knapp, A.: The Diagnostic and Therapeutic Use of Uveal Pigment in Injuries of the Uveal Tract and Sympathetic Ophthalmia. *Bull. Johns Hopkins Hosp.*, 1922, xxxiii, 419.

In a previous article by Woods, clinical and experimental studies on the immune reactions following injuries to the uveal tract were presented.

These showed that when normal healing took place without the occurrence of a sympathetic disturbance in the other eye, substances developed in the blood serum which gave a positive complement-fixation reaction with an antigen made from the pigment of the uveal tract. On the other hand, when normal healing was delayed and sympathetic disturbance occurred in the other eye, this complement fixation reaction to pigment antigen was absent, and in one case of sympathetic disturbance there appeared to be definite hypersensitiveness to the pigment. There was also evidence leading Woods to the conclusion that the occurrence of this complement-fixation reaction indicates the development of immunity to the pigment and gives definite protection against a sympathetic disturbance in the other eye.

The significance of this phenomenon with regard to the prognosis of intra-ocular injury involving the uveal tract is at once evident. If the conclusions drawn are correct, the development in the blood serum of a positive complement-fixation against pigment antigen would warrant a favorable prognosis and allow the surgeon to leave the injured eye without fear of a sympathetic disturbance in the other eye. On the other hand, failure to develop a positive reaction would indicate definitely that sympathetic ophthalmia is a complication to be feared and that the injured eye should be removed.

The possibility of using uveal pigment therapeutically in a sympathetic ophthalmia is also manifest. As soon as hypersensitivity is demonstrable, the self-evident course would be to desensitize the patient, and then, as a therapeutic measure, proceed either to active or passive immunization.

The immune reaction associated with intra-ocular injuries involving the uveal tract of the eye was made use of in seventeen cases as a diagnostic procedure. In ten cases, in which the complement-fixation reaction was positive, there was normal healing without any sympathetic disturbance. Of three cases in which the reaction was negative, one showed clinically a malignant sympathetic ophthalmia, and two showed definite signs of sympathetic irritation. In three other cases with negative reactions the injured eyes were enucleated as a precautionary measure. The reaction was negative also in two cases of old sympathetic ophthalmia.

The one case of malignant sympathetic ophthalmia showed a positive skin reaction to the intradermal injection of pigment. Uveal pigment was used as a therapeutic agent. The patient was first desensitized to the pigment and then actively immunized. The effect of this treatment was apparently beneficial.

This case of sympathetic ophthalmia was that of a boy aged 8 years. The condition developed after an operation for perforated corneal ulcer with prolapse of the iris following gonorrhœal ophthalmia. The inflammation was steadily progressive and associated with all the symptoms of the severe type of sympathetic disease, despite treatment by diet, intestinal irrigations, pilocarpine sweats, mercury inunctions, large doses of sodium salicylate, and non-specific protein therapy. Following desensitization and immunization with uveal pigment, the process was arrested, the eye became white and free from inflammation, and the tension fell to normal. The process continued active for three months but has now been stationary for two months. Vision is 6/60. The eye shows peripheral retraction and flat total adhesion of the iris and capsular opacities. The tension still remains normal.

JAMES P. FITZGERALD, M.D.

Ratnakar, R. P.: Cataract Extraction with Iridotomy. *Indian M. Gaz.*, 1922, lvii, 337.

To counteract the tendency to prolapse of the iris after a simple extraction the following technique is suggested:

After the usual incision in the cornea is made, the iris is picked up near the periphery and a radial slit, 2 to 3 mm. in length, is made in it with straight, sharp scissors. The capsule is then cut and the lens expressed. The slit in the iris permits the contents of the posterior chamber to escape into the wound and thus obviates the possibility of prolapse of the iris. This slit does not heal, but it is scarcely visible and the pupil remains round and central.

Instead of the combined extraction, a complete iridotomy may be performed with extraction. After the corneal incision is made the iris is grasped at the pupillary margin, pulled out of the wound, and incised toward, but not completely to, the periphery. This may be done with little or no pain. The vessels are not cut across, as in iridectomy, and the resulting coloboma is smaller and more regular.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Esser, I. F. S.: Metal Inlays and Cobblers' Splint Dressings (Metalleinlagen und Schusterspanverbände). *Munchen med. Wchnschr.*, 1922, lxix, 1154.

In some cases it is necessary to incorporate pieces of metal in the flaps used in nasal plastics to obtain the support required as cartilage is apt to become necrotic when subjected to tension and in some instances renders the flaps too bulky. The precious metals are the most desirable for this purpose as they are durable and not affected by the tissues and tissue fluids. Gold, with a slight admixture of other metals to increase its elasticity and firmness, is used most frequently, but bronze aluminum and various dental metals, such as the Victoria metal, are applicable.

In plastics of the face the parts to be operated on must be completely immobilized. This is done best and most simply by means of a cobbler's splint stretched in an arch over the wound, pasted to the cheek or scalp region with mastisol, and fixed with a bandage. The portions of the face which must be brought forward are held in the desired position by leaving the threads long and suturing them to a suitable point on the arch of the cobbler's splint. The cobbler's splint dressing is cheap and easily obtained; it does not exert pressure or slip out of place, and it permits easy examination of the wound. The wound is sprinkled lightly with calomel and treated open. When calomel comes in contact with moisture it gives off corrosive sublimate in a nascent state; in dry wounds it does not irritate at all.

TROMP (Z).

Waltz, M. B.: Report of a Case of Bilateral Frontal-Sinus Empyema, Subdural and Subperiosteal Abscess, with Recovery. *Laryngoscope*, 1922, xxxii, 966.

The author reports an interesting case of bilateral frontal-sinus empyema and subdural and subperiosteal abscess in a male 19 years of age. Headache and nasal discharge followed an acute cold which developed about two weeks prior to the first examination.

With the exception of the examination of the head, the general physical examination was negative. The spinal fluid was clear but under great pressure.

There was noticeable swelling of the frontal region extending to the hair line above and to the upper left eyelid below. On aspiration in the frontal region pus was obtained. The nerve head in both eyes was swollen about two diopters.

The plates showed a cloudy condition of all the sinuses. A smear of the pus showed staphylococci. The white blood count was 14,000.

A Killian incision was made over the left frontal region where a large subperiosteal abscess was found. The left frontal sinus was opened and drained of pus. After the complete exposure of the left frontal sinus, pus was found coming from the right side. The incision was then continued and the right sinus completely uncovered. A necrotic opening was discovered in the left orbital roof. The orbital roofs were therefore removed, the ethmoids were opened and curetted, and a large opening was made into the nose. Pus was then found to be coming from an opening near the floor of the sinus on the left side near the midline. On removal of the inner table a large subdural abscess was discovered. The wound was packed with gauze through the nose and external opening.

With the exception of two convulsions on the eighth day, which were probably due to pressure from the gauze packing, the postoperative course was uneventful.

JAMES C. BRASWELL, M.D.

Husik, D. N.: Total Blindness of Both Eyes in a Boy 7 Years of Age Cured by an Ethmoid Operation and Opening of the Sphenoid Sinus. *Laryngoscope*, 1922, xxxii, 874.

The boy whose case is reported became totally blind following a cold in the head with severe rhinorrhœa. In spite of negative clinical findings in an examination of the nose, the seriousness of the condition seemed to indicate the removal of the major portion of the middle turbinates and curettement of both ethmoids and sphenoids. This was done, but no evidence of disease was found. The tonsils and adenoids were removed at the same time. Three days after the operation there was a profuse purulent nasal discharge. Convalescence then ensued rapidly. Three months after the operation all tests showed normal vision.

MAURICE H. COTTLE, M.D.

THROAT

Lipshutz, B.: The Clinical Importance of Ossification of the Stylohyoid Ligament. *J. Am. M. Ass.*, 1922, lxxix, 1982.

Lipshutz reports a case of unilateral complete ossification of the stylohyoid chain which consists of three parts: (1) the stylohyoid process, (2) the stylohyoid ligament, and (3) the lesser cornu of the hyoid. In this case, unlike others reported in the literature, there was no movement whatever between the different segments of the chain.

The clinical importance of this condition lies chiefly in the tonsils, as it may interfere with the operation of tonsillectomy or give rise to vague symptoms of discomfort in the throat. Because of

these possibilities the tonsillar region should be palpated before tonsillectomy is attempted. The roentgen ray will reveal the presence of variations in the stylohyoid chain.

As long as the process is directed downward and parallel with the carotid artery no trouble is apt to develop, but if it is directed medially, as the result of development or trauma, there may be more or less irritation of the pharynx.

The treatment consists in fracturing the process and removing the distal portion with bone forceps or, in rare cases, removing the entire process surgically.

O. M. Rorr, M.D.

Jackson, C.: Notes on Peroral Endoscopy and Laryngeal Surgery. *Laryngoscope*, 1922, xxxii, 868.

The author discusses (1) bronchoscopy in asthma and asthmatic bronchitis; (2) arachidic bronchitis; (3) benign stenosis of the œsophagus; and (4) the diagnosis of foreign bodies in the lungs.

Gottlieb has pointed out that in determining the etiology of bronchial asthma the susceptibility of the bronchial mucous membrane to reinfection and the habits and psychology of the patient must be considered. Mental stress must therefore be relieved and the patient kept from contact with persons with respiratory infections. The use of vaccines and the intrabronchial application of astringents such as silver nitrate and tannic acid are also indicated. Synn reports good results from the repeated use of 10 per cent silver nitrate.

In cases of aspiration of a peanut kernel which were reported by Chamberlin, Murphy, and Lynah, the bronchi showed severe inflammation and contained a thick tenacious mucus. Complete removal of the foreign body by bronchoscopy without the use of an anæsthetic resulted in cure.

Green reviews the different methods of œsophageal dilation and reports eight cases treated through the œsophagoscope.

Maurice H. Cotton, M.D.

MOUTH

Pfahler, G. E., and Widmann, B. P.: A Case of Tubercular Gingivitis Treated with Apparent Success by Radium. *Am. J. Roentgenol.*, 1922, n.s. ix, 156.

Although tuberculosis of the oral cavity is comparatively common, a search of the literature failed to reveal any cases treated with radium.

In the case reported by the author the lesions first appeared as small punctate areas scattered about the gum margins of the upper and lower canines and lateral incisors and the left lower molars on both the labial and lingual surfaces. These soon blended, forming irregular, serpiginous lines extending well down over the surfaces of the gums and a large area of the left cheek. The ulceration became progressively more definite and invading, but remained always fairly superficial and showed sharp, red, irregular borders within which were interspersed soft granulations with pinhead spots of yellow and gray and occasionally covered with cloudy films of dirty yellowish serum. The condition caused much irritation and frequent pain.

A 16-mgm. plaque of radium covered with 1 mm. of rubber was fixed to a wooden tongue depressor and held firmly on as many areas as necessary to cover all of the lesions. The time of application to each area was twenty minutes. Special care was taken to guard against a local reaction and destructive effects and to keep at all times within the range of a stimulating dose. Seven applications were made at intervals of three weeks. The dose given was between one-third and one-half of a skin erythema dose.

After each seance the lesions grew paler and the pain decreased. Ultimately all ulceration, irritation, and pain disappeared. About four months later, when this report was written, there was no sign of recurrence.

Arbuth Harrison, M.D.

Aievoli: Tuberculosis of the Salivary Glands (La tubercolosi delle ghiandole salivari). *Ann. Ital. di chir.*, 1922, i, 718.

Aievoli states that our knowledge of tuberculosis of the salivary glands is due to Italian research. In 1843 De Pavlo of Perugia reported the first case of tuberculosis of the parotid gland, and in 1893 Aievoli reported the first case of tuberculosis of the submaxillary gland. Since then very few cases of salivary gland tuberculosis have appeared in the literature.

As the condition has no special clinical symptoms, it has been diagnosed as abscess or a mixed tumor of the glands.

Tuberculosis of the salivary glands in its typical form may be classed with tuberculomata. It has a tendency to fibrous organization.

The few cases collected show that the treatment should be operative and radical. Apparently the granulomata can be removed successfully but in none of the cases reported were the end-results known.

W. A. Brennan.

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SURGERY OF THE EYE AND EAR

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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INTERNATIONAL ABSTRACT OF SURGERY

MAY, 1923

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Grant, A. R.: No-Hand-Touch Technique. *Surg., Gynec. & Obst.*, 1923, xxxvi, 106

The technique described is as follows:

The instrument nurse threads the needle with sterile forceps, not touching the gut or the needle with her gloves.

The surgeon transfixes the tissue, pulls the needle through with a needle holder, and catches both strands of the suture near the needle with dissecting forceps in the left hand; he pulls on the left end with the left-hand forceps until the right short end is only ½ in. from the point of transfixion. The long end should be proximal, and the short end distal, to the operator.

He lays the point of the needle holder across and on top of the suture just below the tips of the dissecting forceps and makes a loop around the needle holder.

He catches the short end of the suture with the needle holder, keeping its tips close to the site of the knot, while the left hand pulls the first half of the knot tight. He places the tips of the needle holder beneath the suture and makes a second loop which completes the reef or square knot.

JAMES A. H. MAGOUN, M.D.

Howard, C. A.: That Baneful Cathartic after Abdominal Operations. *Canadian M. Ass. J.*, 1923, xiii, 36

In 200 cases of peritonitis treated by the author no postoperative cathartic was given. It is Howard's belief that better results are obtained by allowing the patient to remain quiet than by giving him a dose of calomel a few days after operation, thereby making him restless.

The intestines, he states, will resume their normal function when normal tone returns. The administration of 20 oz. of saline solution daily for three days by Murphy drip is usually all that is necessary. In some cases Howard does not give a cathartic until eight or nine days after the operation, and in others not until the patient goes home.

It has been noted that vomiting is made worse by purgation. In severe cases of peritonitis a cathartic is very harmful and at times exceedingly dangerous. When the abdomen is distended, purgatives are worse than useless.

The author states that before he adopted his present methods his results were scarcely as good as the average, but since then they have greatly improved.

GEORGE E. BEILBY, M.D.

Cattell, M.: Studies in Experimental Traumatic Shock: The Action of Ether on the Circulation in Traumatic Shock. *Arch. Surg.*, 1923, vi, 41.

This study was undertaken in an attempt to determine the effects of ether on the factors which influence the blood pressure, with special reference to shock or circulatory failure. The author first considered the effects of ether on the blood pressure, and then its action on the heart, the vasomotor system, and the blood vessels.

The interpretation of blood-pressure changes caused by ether is extremely difficult. According to the literature on this subject, ether properly administered to normal subjects causes no fall in the blood pressure and may even cause a transitory increase during the early stages of its administration. In shock, circulatory collapse frequently occurs.

Most of the author's experiments were performed on cats. In determining the effect of ether on the blood pressure of shocked animals the methods used in obtaining the records and in administering the ether were similar to those used for the normal animals. The effects on the blood pressure were strikingly different after the development of shock. In the course of work at the laboratory it was noted that higher concentrations of nitrous oxide may result in a fall in blood pressure nearly as great as that due to ether. In some of the animals it was impossible to obtain complete abolition of the eye

reflex without a fall in the pressure, but this fall was always less than that resulting from ether.

The experimental evidence regarding the effects of ether on the heart strongly favors the assumption that in the concentrations of ordinary anæsthesia, ether causes a decrease in the efficiency of the heart which might account for any fall in arterial pressure occurring under ether anæsthesia. With regard to the effect of ether and chloroform on the vasomotor center, some observers report a dilatation of the blood vessels and others a constriction.

The evidence obtained by the author supports the supposition that the drop in pressure caused in the shocked animal is due to some disturbance of the vasomotor system. The increase of the effect of ether in shock does not apply to ether injected directly into the circulation in small amounts, being true only for the inhalation experiments, when general anæsthesia is produced. In a series of experiments on the perfusion rate of fluid through the vessels of the hind legs of the cats used by the author during the development of shock due to muscle injury, it was found that as the blood pressure fell there was a gradually increasing constriction of the peripheral vessels.

The following conclusions are drawn:

1. In the normal animal the inhalation of strong ether results in a sudden drop in the arterial pressure which is temporary. As the anæsthesia deepens, the pressure gradually recovers until, by the time the eye reflex has disappeared, it may have returned to its original level.

2. In the shocked animal there is no recovery of the blood pressure after the primary fall, and the pressure continues to fall to zero even before the eye reflex disappears.

3. Nitrous oxide and oxygen, in the most favorable proportions, can be administered to the shocked animal without causing more than a slight drop in the blood pressure.

4. Observations on the heart volume of normal cats and on the contractions of the isolated hearts of cold-blooded animals, together with deductions from blood-pressure records, show that from its very beginning, the administration of ether results in depression of the heart and a decrease in its output which is sufficient to account for the fall in pressure in both the normal and the shocked animal.

5. The injection of large doses of epinephrin intravenously in shocked animals usually results in the disappearance of the sensitiveness to ether for a period of an hour or longer. There is reason to believe that this is due to an antagonistic action of the ether on the heart. Pituitary extract does not influence the pressure drop caused by ether in the shocked animal.

6. Determinations of leg volume with a plethysmograph, perfusion rate measurements, the results obtained by the injection of ether directly into the circulation, and the form of the blood-pressure curves indicate that ether causes a contraction of the peripheral vessels. This constriction may be due to: (1) direct stimulation of the vasomotor center, and (2) a reflex to the fall in pressure resulting from depression of the heart.

7. In the blood-pressure curves resulting from the administration of ether to the normal animal the primary drop is due probably to an influence on the heart, and the subsequent recovery of the blood pressure to a compensatory vasoconstriction.

8. In the shocked animal no evidence of vasoconstriction caused by ether was obtained, and pressor effects from asphyxia or sensory-nerve stimulation became less or were entirely absent.

9. The condition of ether sensitiveness is brought about by any circumstances which tend to depress the animal's general condition, such as low blood pressure, hæmorrhage, severe operations, or the injection of acid into the circulation.

10. The cause of the greater depressing influence of ether on the blood pressure in shock appears to be a disturbance of the vasomotor system. The usual compensatory constriction no longer occurs to offset the decreased output of the heart, and the pressure continues to fall. This might be due to a depression of the vasomotor center or to an already present maximum tone of the center.

GEORGE E. BEILBY, M.D.

SURGERY OF THE HEAD AND NECK

HEAD

Da Fano, C.: Herpetic Meningo-Encephalitis in Rabbits. *J. Path. & Bacteriol.*, 1923, xxvi, 85.

The vesicular fluid of all types of herpes, with the possible exception of herpes zoster, contains a virus which causes death when it is injected into rabbits. Regardless of the route of transmission, the disease may be carried from animal to animal. It is not yet known whether the virus is filtrable, and its cultural characteristics are still undetermined.

One of the principal localizations of the disease is the central nervous system where it causes an inflammatory lesion characterized by diffuse small-cell infiltration, nerve-cell degeneration, and proliferation of some of the fixed elements of the thalamus, mesencephalon, and pons. The disease has been termed "herpetic meningo-encephalitis."

While in lethargic encephalitis, nerve-cell degeneration is rather focal and the soft membranes are frequently unaltered, it is striking that the differences should be no greater between a disease of the central nervous system in man and a disease artificially produced in animals. The author found granular structures identical with the "minute bodies" found within and outside of the central nervous system in cases of lethargic encephalitis.

It is suggested that these granular structures may be the virus or particles of organic material to which the virus is attached. LOYAL E. DAVIS, M.D.

Knoll, W.: The Picture of Hypophyseal Cachexia (Beitrag zum Bilde der hypophysaeren Kachexie). *Wien. Arch. f. innere Med.*, 1922, iv, 555.

The author reports a case of hypophyseal cachexia in a man 23 years old who died from pulmonary tuberculosis. Within a period of a year the patient failed visibly, showing loss of energy, marked emaciation, loss of hair, increasing apathy, and mental clouding. Because of the pulmonary disease the diagnosis of hypophyseal cachexia was not made.

Autopsy revealed, in addition to the pulmonary tuberculosis, tuberculosis of the anterior lobe of the hypophysis (adenohypophysis). The posterior lobe was entirely normal. In the anterior lobe there were few ectodermal cells, but a considerable number of eosinophile cells.

Etiological factors of hypophyseal cachexia include puerperal sepsis, tuberculosis, and syphilitic processes. Simmonds believes that septic embolism of the artery supplying the anterior lobe is the cause in women with a febrile puerperium and this results in complete atrophy and fibrous transformation. Gummata and tuberculosis may also cause the disappearance of the anterior lobe (the cases of Fahr, Saenger, and Reye). In partial atrophy the signs of loss of the gland are absent, the condition being recognized only as a secondary finding at autopsy.

The chief symptoms of the condition are premature senility, loss of hair, a decrease in the function of the sexual glands, and psychic changes at a period of life at which such changes do not usually occur.

In the treatment, the etiology (syphilis) must be considered; in addition, the administration of fresh hypophyseal substance is indicated.

The author regards hypophyseal cachexia as a disease of sexual maturity caused by the loss of function of the anterior lobe of the hypophysis which reacts upon the mature sex glands. He calls attention to the change in the finer structure of the anterior lobe during pregnancy and ascribes the very destructive effect of the septic embolism of this anterior lobe in Simmonds' cases to the fact that it affected an organ in the process of involution. He calls attention to the well-known phenomenon of loss of hair in women a few weeks after confinement, which he attributes to the marked physiological activity of the hypophysis at the time of pregnancy. ROTHFUCHS (Z).

Thompson, J. E.: Atypical Plastic Operations for Congenital Fissures of the Lip and Palate. *Surg. Clin. N. Am.*, 1922, ii, 1387.

The author describes two cases of atypical plastic operations for congenital fissures of the lip and palate.

In repairing a complete fissure of the lip extending into the nostril the curve of the deformed nostril must be restored so that it will resemble the sound one in every detail, the lip must be made long enough, and the vermillion border must be restored.

In the first case, that of a 6-year-old boy, there was a congenital fissure of the lip and palate in which the lip had been operated upon twice unsuccessfully with consequent complete destruction of the philtrum. On the left side the fissure of the lip was complete into the nostril; the alveolar border was cleft and the fissure extended backward through the hard and soft palates. On the right side the margin of the nostril was intact, but the rest of the lip was fissured. The anterior margin of the alveolar border was grooved at the junction of the maxilla and premaxilla. The original skin (philtrum) covering the anterior surface of the premaxilla had been destroyed and replaced by a thin layer of epithelium of low vitality resting on a base of dense scar tissue. In several areas the surface was ulcerated. There were no erupted teeth in the premaxilla and the X-ray showed the presence of only two tooth germs, which doubtless represented the permanent central incisors. The temporary teeth had probably been extracted during previous operations.

On the palatal surface the union of the maxilla and premaxilla was complete. The septum was attached to the right edge of the palatal fissure. The premaxilla was separated from the front of the left maxilla by an interval of about 3 mm. The palatal plates on both sides were very precipitous. The free edge of the left palatal plate was fully 2 mm. higher than that on the right side, which was attached to the septum. The palatal fissure was not more than 5 mm. wide at its widest. The mucous membrane covering the palatal plates was entirely normal. No operation had been performed on the palate.

The following sequence of operations was decided upon: (1) repair of the palate and replacement of the premaxilla; (2) repair of the lip and nostrils.

Repair of the palate. Langenbeck's side incisions were made and the palate was repaired from end to end in the usual manner without difficulty. Mattress sutures of silkworm-gut were used in both the hard and the soft palate. A wedge-shaped portion of the septum was removed and the premaxilla pushed back into place. It was not sutured to the left side of the maxilla, but was held in place by a strip of adhesive plaster passed over its anterior surface and fastened to the cheeks. The palate healed from end to end by first intention. Unfortunately the adhesive plaster irritated and destroyed the skin covering the premaxilla; therefore it was removed in thirty hours. In consequence, the premaxilla did not stay in contact with the left maxilla, but projected forward again.

Three months later the premaxilla was again molded into place. After denudation of the opposed sides of the premaxilla and the left maxilla a silver wire suture was passed through the front of the left maxilla and around the premaxilla, and the two bones were brought into contact. After three weeks the wire was removed. Firm union resulted.

Repair of the lip. The philtrum had been completely destroyed during the previous operations, and the epithelial covering of the premaxilla was of such low vitality that it was useless for any purpose. The left nostril flared wide open and the ala nasi was separated from the columella for a considerable distance. The right nostril was completed by a ring of normal tissue. Below this, the right margin of the cleft flared outward at a sharp angle. The margins of the cleft were separated from one another by a distance of 32 mm. just below the alæ nasi, and by a distance of 45 mm. at the free edge of the lip. It was intended to make a transverse incision into the cheek on each side just below the nostrils and bring the two flaps toward the middle line so that when they were united by their mesial edges they would cover the premaxilla and form a new philtrum. Each of the lateral incisions was carried outward to a point just below the outer angle of the orbit. A vertical cut was made upward behind each ala nasi to liberate it and allow it to be carried inward in a curve toward the posterior end of the columella to which it was subsequently attached. At the posterior end of each transverse incision a triangular area of cheek was finally excised to smooth out the fold or pucker that resulted when the flaps were put under tension and their anterior ends were united. The free inner margins of the flaps were pared exactly as is done in an ordinary harelip operation and then united.

The result was very satisfactory from the operative standpoint. Good firm union occurred from end to end. From a cosmetic standpoint the result was not so pleasing. The nostrils were fairly satisfactory, but the lip was probably too long (deep), although it is a little early to speak finally on this point. As time passes the nose will straighten itself out, the nostrils will become less prominent, and the lip will become narrower. The most serious disappointment is the mouth. The angles of the new mouth are drawn very close together, and the lower lip has been thrown into an ugly prominent curve with everted mucous membrane.

The second case, that of a 5-year-old girl, was a case of complete unilateral congenital fissure of the lip and palate on the left side which had been operated upon several times. The lip and nostril showed serious defects. The palate had suffered severely, showing complete loss of the central part of the velum on each side and irregular union of the muco-periosteum in front.

The general contour of the lip was not unpleasing. It was of the proper length (depth), but there was no notch on its free margin. The mucocutaneous line was defective, showing a distinct break. The left nostril was considerably out of place. Its aperture lay on a plane posterior to its fellow. The ala nasi was displaced outward and backward, and flared so as to expose on the surface a demilune of mucous membrane which, under normal circumstances, would have been lying on the floor of the nasal passage. Just below this demilune was a deep pucker or crypt. The mushroom-shaped curve of the under-surface of the nose was quite flattened on the left side.

The alveolar border showed a very narrow fissure between the left central incision and the canine. No evidence of the left lateral incisor could be found. It may have been removed at one of the previous operations. The palate immediately behind the alveolar process was intact for a short distance. Then came an irregular fissure, 12 mm. long, and finally a line of union which reached to the level of the posterior margin of the hard palate. From this point the middle of the velum was missing. The lateral parts of the velum were prolonged backward, diverging widely, into the palatoglossi and palatopharyngei muscles, between which on each side lay the tonsil. The tonsils were unusually large.

The following sequence of operations was decided upon: (1) removal of the tonsils; (2) plastic repair of the lip and nostril; (3) reconstruction of a new soft palate from the palatoglossi and palatopharyngei and the pharyngeal wall; (4) closure of the fissure in the hard palate.

Up to the present date the first three steps have been completed satisfactorily.

Removal of the tonsils. The tonsils were dissected out May 18, 1922, with extreme care to preserve both palate muscles intact.

Plastic reconstruction of the lip and nose. This was done June 6, 1922. An incision was carried from the top of the nose backward along the under-surface of the middle of the columella to its juncture with the philtrum, thence outward, below and parallel to the margin of the nostril, across the scar of the repaired lip underneath the ala nasi in a curve, and finally downward in a curve until it reached the red line of the lip at a point previously fixed. The puckered scar tissue and depressions were removed. The dissection was carried between the alar cartilages until the lower edge of the cartilaginous septum was reached. The crus mediale of each cartilage was separated thoroughly from the side of the septum behind and from its fellow cartilage in front. The alar cartilage on the affected side was now made to slide forward on its fellow, carrying with it the displaced nostril. By this manœuvre the margin of the incision on the affected side slipped forward on the other margin which remained fixed. The edges were then sutured in their new position. It was necessary to carry the median incision in the columella farther forward over the tip of the nose in order to separate the alar cartilages far enough to let the left cartilage slide forward. This brought the scar into view. At first it was rather objectionable, but in a few weeks was scarcely noticeable.

Reconstruction of a new velum from the palatoglossi and pharyngei and the pharyngeal wall. This operation was performed July 1, 1922. After the removal of the tonsils the deep surfaces of the palatoglossi and palatopharyngei had fused together except at their extreme posterior ends. There seemed to be very little muscular tissue in them. They always

appeared to be nearer together before anæsthesia than during deep narcosis. Probably the gag had something to do with this.

The palatoglossus was cut as near the tongue as possible and the incision carried upward and outward into the cheek through the mucous membrane lining the angle between the posterior ends of the maxilla and mandible. The palatopharyngeus was then cut where it fused with the pharynx and the incision carried through the pharyngeal mucous membrane as high as the eustachian tube. In this manner a somewhat curved triangular flap was thrown upward and inward. The base of the flap abutted on the posterior end of the maxillary alveolar margin and its blood supply was derived from the descending palatine artery. Short Langenbeck side incisions were then made along the inner margin of the alveolar processes on each side and the remnant of the velum palati lifted up from its bed until it was free from all tension. Finally the mesial edges of the flaps were pared and sutures were passed. Following the author's usual custom, vertical mattress stitches of silkworm-gut were made. Union by first intention followed. The reconstructed palate was firm and strong, although somewhat short and stubby.

At the time this article was written the fissure in the anterior part of the palate had not been repaired. This operation will be postponed for several months to allow the posterior part of the palate to become thoroughly vascularized.

O. M. Rott, M.D.

McWilliams, C. A., and Dunning, H. S.: Rhinoplasty and Cheek, Chin, and Lip Plastics with Tubed, Temporal-Pedicled Forehead Flaps. *Surg., Gynec. & Obst.*, 1923, xxxvi, 1.

The authors are of the opinion that transplanted cartilage usually remains permanently in position and is seldom absorbed even though X-ray examination does not reveal its presence. For the insertion they prefer a transverse incision (Fig. 1, A), as it does not leave a noticeable scar and is not apt to become infected. This is adapted to cases in which it is not necessary to provide support for the columellæ.

The Indian and Italian methods have many faults. The Indian method leaves an unsightly scar in the center and most prominent part of the forehead. By the Italian method skin from the arm is transplanted with difficulty. Moreover, this skin is not the same color or texture as that of the face.

For most plastics on the cheeks, chin, and nose, the temporal-pedicled forehead flap, taken from behind the hair line, is the most suitable and gives the best results. The objection that the transplanted flap grows hair is not important for the hair can be permanently removed by the X-ray in a short time. A flap is obtained from the side of the forehead, its base containing the superficial temporal artery. The inner surface, including the pericranium, is undermined. A Thiersch graft is applied to the under-side before the transplantation is done. If a cartilaginous support is needed, it is procured from the costosternal juncture and inserted between the skin and pericranium of the graft, the flap being then left in place two weeks before it is transplanted. The blood supply is adequate, and the flap remains soft and pliable on account of the Thiersch grafts on its under-surface (Figs. 2 and 3). After three weeks the flap is freed and replaced on the forehead. The edges of the wound are freshened and sutured with interrupted sutures of silkworm gut. At the same time any remaining defect in the forehead is covered with Thiersch grafts.

In the authors' opinion the results of finger transplantation to correct nasal defects are unsatisfactory.

William J. Pickett, M.D.

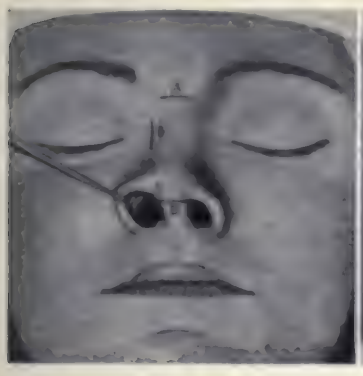


Fig. 1.



Fig. 2.



Fig. 3.

Fig. 1. Incisions (Sheehan) used for insertion of cartilage into saddle nose. *A*, infraglabellar incision preferred by the authors. *B*, inner canthus incision. *C*, ala incision for insertion of cartilage laterally. *D*, horizontal end incision, not incision of choice because of danger of infection.

Fig. 2. Tubed pedicle forehead flap taken within the hair line of the right temporal region and reflected into the nose.

Fig. 3. Side view of final result.

Taussig, L. R.: The Radium Treatment of Carcinoma of the Mouth. *Med. Clin. N. Am.*, 1919, vi, 383.

A large percentage of the cases referred for radium treatment at the present time are the hopeless ones which have been treated unsuccessfully by surgery or in which the seeking of expert advice has been deferred until the possibility of cure has passed. In spite of this, the number of satisfactory results has been encouraging, and soon it will be possible to recognize the class of cases for radiotherapy given alone or in combination with surgery.

The author reports three cases to illustrate the types of mouth malignancy suitable for radium treatment.

One case was that of a man 40 years of age who first noticed an ulcer on the right side of his tongue about four months prior to the initial examination. The lesion was a fissure-like ulceration in a hard, nodular mass extending from just in front of the anterior pillar to within about 4 cm. of the tip of the tongue. The palpable induration projected well over the midline. Lues was ruled out by the Wassermann test. The lesion was too extensive for surgery or the actual cautery. The treatment of choice in this case was unscreened tubes of radium emanation.

The tubes are inserted in the malignant tissue rather than in the normal tissue surrounding the malignant area. The true reaction, which consists of a burning pain in the tongue and swelling, usually begins about one week later. The period and intensity of the reaction is variable. If metastatic glands develop it is advisable to remove them surgically if possible. If the condition is not operable, bare tubes of the emanation should be inserted.

In the second case the author found a tumor on the inner surface of the left cheek of an upholstery worker about one year ago. The lesion was nodular, hard, about 6 cm. in diameter, and about 1½ cm. high. The glands were not palpable. Five bare tubes, totalling 9.5 mc., were inserted into the mass. On account of the suspicious appearance of the tongue, mixed treatment was given for a time under the impression that the carcinoma might have developed on a luetic base. Within a month the reaction subsided and the mass had entirely receded. Two months after treatment a hemorrhage occurred. Five months later an area of increasing thickening was noticed. Additional treatment of four bare tubes was then given. Five months ago a hard nodule developed at the tip of the tongue. Two bare tubes totaling 1 mc. were inserted into the mass. The tongue is still tender but there is no evidence of recurrence at the present time. The author feels that this case has responded well to radiotherapy.

The last case was a nodular, ulcerative, hard lesion of the posterior edge of the soft palate, involving the left side of the uvula. A course of antiluetic therapy given in spite of a negative blood Wassermann had no effect upon the growth. Four bare tubes were then inserted into the tumor. One month later one bare tube was inserted in a suspicious area on the left side of the uvula. Only one week has elapsed since the last treatment, but the entire area feels soft. The cervical region was given a course of X-ray treatment soon after the first bare tube treatment. JAMES C. BRASWELL, M.D.

Simpson, F. E.: Carcinoma of the Tongue Treated by Embedding Glass Ampoules Containing Radium Emanation. *Chicago M. Rec.*, 1923, xlv, 479.

The embedding of glass ampoules containing radium emanation is superior to the usual methods of applying radium and better than surgery because: (1) the soft beta rays are effective; (2) under favorable circumstances every cancer cell may be destroyed; (3) the effect of the radiation is to some extent selective, i.e., the cancer cells are damaged more than the normal tissue cells; (4) the effect of the radiation extends at least 1 cm. beyond the site of the ampoule; (5) the dosage is exact; and (6) traumatism is minimal.

After local anæsthesia is obtained the glass ampoules are boiled and inserted into the sharp end of a sterile needle which admits a plunger at the other end. Before the ampoule is ejected by the plunger the needle is withdrawn a few millimeters in order to prevent breaking the ampoule by forcing it against the tissue.

Usually from five to fifteen ampoules are inserted into the tumor tissue. Each contains ½ mc. The ampoules are placed about 1 cm. apart and allowed to remain permanently or until they slough out in the course of healing.

The radio-activity of the ampoules is lost in about fourteen days. Healing occurs in from four to eight weeks and usually leaves a smooth cicatrix.

M. N. FELDSTEIL, M.D.

NECK

Glogau, O.: Abscesses Descending from the Upper Air Passages. *N. York M. J. & Med. Rec.*, 1923, cxvii, 29.

Glogau has worked out an operative procedure for abcesses descending into the deep tissues of the neck from the region of the pharynx, the tonsils, the base of tongue, or other nearby structures. As the course down the neck is the same, whatever the origin of the condition, the method is applicable to every case. A skin incision is made over the anterior margin of the sternocleidomastoid muscle from the level of the posterior angle of the jaw to the jugular fossa. By blunt dissection the superficial tissues are pushed back and the anterior margin of the vessel sheath is retracted, the omohyoid cut, and the anterior mediastinum exposed. A tampon of gauze is inserted to prevent the purulent material from entering the mediastinum. If the anterior mediastinum has already become infected, it is drained. By lifting the thyroid forward the pos-

terior mediastinum and the peri-œsophageal tissues are exposed. Another tampon is inserted in this region. The abscess is located by sharp and blunt dissection begun at the upper angle of the wound and continued into the depths, and is then opened and drained.

In the after-treatment the mediastinal tampons are removed about the fourth day and the drains into the abscess are removed according to the indications. A careful pharyngeal examination is a great aid in the final stage of the operation.

The author reports three cases in which he used this method with complete success.

RALPH B. BETTMAN, M.D.

Lahey, F. H.: Tuberculous Glands of the Neck and Spinal Accessory Paralysis. *Surg. Clin. N. Am.*, 1922, ii, 909.

Tuberculous infection of the cervical glands is usually located in front of or beneath the sternomastoid muscle, opposite the angle of the jaw, and is common on both sides of the neck. Palpation is important in the differentiation of simple inflammatory glands, tuberculous glands, Hodgkin's disease, and malignancy. Tuberculous glands may be discrete or fused, depending upon the amount of caseation and secondary infection present. They persist for months without evidences of acute inflammation. Tenderness occurs after caseation with secondary liquefaction and infection. Tuberculosis may be associated with Hodgkin's disease. As a rule, fever appears only after secondary infection. The author has never observed the simultaneous occurrence of cervical, axillary, and inguinal tuberculous adenitis. When actinomycosis can be eliminated the presence of a chronic sinus suggests tuberculosis.

The treatment consists in:

1. Removal of all possible septic foci draining into this region, such as teeth, tonsils, and adenoids. The tonsils are frequently the portal of entry of the tubercle bacilli. Septic foci saturate the glands with toxic substances which lower the resistance to infection by the tubercle bacillus.
2. Supervision and control of the patient's living conditions.
3. X-ray treatment of the glands before operation or after foci and abscesses have been drained.
4. Tuberculin therapy.
5. Incision and drainage of broken-down glands with secondary infection. Large incisions are not necessary.
6. Radical excision of the glands in certain extensive and persistent cases; in cases of discrete and localized glands which are easily removed without extensive dissection and failed to disappear when other measures were used; and in cases in which the disease continues to spread in spite of conservative treatment.

Division or injury of the spinal accessory nerve in simple incision or radical excision may cause trapezius paralysis. The author has previously reported twelve such cases. In some cases the nerve was carefully preserved but persistent paralysis resulted. Spinal accessory paralysis causes lengthening and sagging of the shoulder. The scapula falls away from the midline. The upper angle of the scapula is prominent on account of its support by the rhomboid muscles and on account of the sagging of the outer angle due to the weight of the arm. The arm can be abducted slightly less than 90 degrees. In cases in which the third and fourth cervical and the spinal accessory nerves anastomose to supply the trapezius muscle the trapezius may function through the cervical plexus after injury of the spinal accessory nerve. In extensive dissections, especially about the internal jugulars, the third and fourth cervical nerves may also be injured.

WALTER C. BURKET, M.D.

Hertzler, A. E.: The Technique of Thyrotomy. *Ann. Otol., Rhinol. & Laryngol.*, 1922, xxxi, 1013.

The author describes the following technique of external operation for the removal of intrinsic tumors of the larynx:

For a distance of 2½ in. with its mid-point over the height of the Adams apple, the skin is infiltrated with a local anæsthetic. From this line, the subdermal tissues down to the surface of the cartilage are injected and the superior laryngeal nerves are blocked. The laryngeal mucosa is then anæsthetized by passing the needle obliquely through the cricothyroid membrane and through the thyroid cartilage, the solution being introduced between these structures and the mucosa.

A vertical incision is made along the line of primary infiltration, and the vessels are clamped and ligated. The thyroid cartilage and the cricothyroid membrane are exposed. These structures are split exactly in the midline dividing the cartilage and the mucous membrane. The edges are retracted and the vocal cords located. After the mucosa is cut, the two parts of the thyroid cartilage are carefully retracted with small retractors. The entire interior of the larynx is then exposed to view and the necessary operation is done. After the operation, the retractors are removed, the cut edges of the thyroid cartilage being allowed to resume their natural position. The fascia over the cartilage is united with interrupted catgut sutures. The skin is closed with horsehair.

ARTHUR L. SHREFFLER, M.D.

Jackson, C.: Cancer of the Larynx. *Ann. Surg.*, 1923, lxxvii, 1.

The author states that cancer rarely if ever develops in a previously entirely normal larynx.

For all clinical purposes the term "precancerous condition" may be defined as any histologically abnormal condition intervening between the normal and the cancerous.

Vocal abuse should be considered a factor in cancer of the larynx. Persistent vocal abuse is one of the most common causes of chronic laryngitis,

keratoses, papillomata, and granulomata. When perpetuated by vocal abuse and other causes, these conditions may favor the development of cancer.

Eversion of the ventricle should be placed in the precancerous class of conditions. In one case the author was able to make a definite diagnosis of cancer on the same side as the eversion ten years after the eversion was first discovered.

In twelve of the author's cases of cancer of the larynx a luetic lesion preceded the cancerous lesion.

Diseased tonsils should be considered a cause of cancer of the larynx as focal infection in the tonsil may be the chief etiological factor in chronic laryngitis and chronic laryngitis may be a precancerous condition. The author is convinced that the chief factor in the etiology of laryngeal papillomata, granulomata, and hæmatomata is some form of irritation, including that due to trauma and chronic inflammation.

The vocal cords are the parts of the larynx subjected to the most irritation. The author has seen two cases in which an isolated cancerous lesion developed on one cord at a point exactly opposite an isolated cancerous lesion on the other cord. During phonation, the lesions touched. In neither case was there any continuity between the lesions.

In the treatment of precancerous laryngeal conditions absolute rest of the larynx is essential. It is difficult to obtain such rest as the dusty atmosphere in most dwellings is injurious.

Laryngectomy is so mutilating that it is unwise to use it in the treatment of a chronically inflamed larynx merely suspected to be cancerous.

Keratosis and similar overgrowths of epithelium occurring in adults are to be dealt with as potentially precancerous conditions.

JAMES C. BRASWELL, M.D.

Giordano, A. S., and Caylor, H. D.: Histologic Study of the Effect of Ligation of the Thyroid Vessels in Exophthalmic Goiter. *Surg., Gynec. & Obst.*, 1923, xxxvi, 75.

Following ligation of the thyroid arteries there is a marked drop in the basal metabolic rate in cases of hyperplastic goiter. In a series of forty-two ligations there was an average drop of from +6 to +39 per cent ten days after the operation.

A histologic study of the thyroid gland was made to determine the involution changes following ligation and to correlate them with the clinical course of the case. The vessels of the glands studied had been ligated for from five to three hundred and two days before thyroidectomy. The portion of the gland away from the ligated pole served as a control. Sections were taken from the gland near the ligated pole and compared with sections from the unligated portion. The size of the follicles, the type of epithelium lining them, and the amount of colloid present were particularly noted.

The most constant finding of the early period in the sections taken near the ligated areas was a

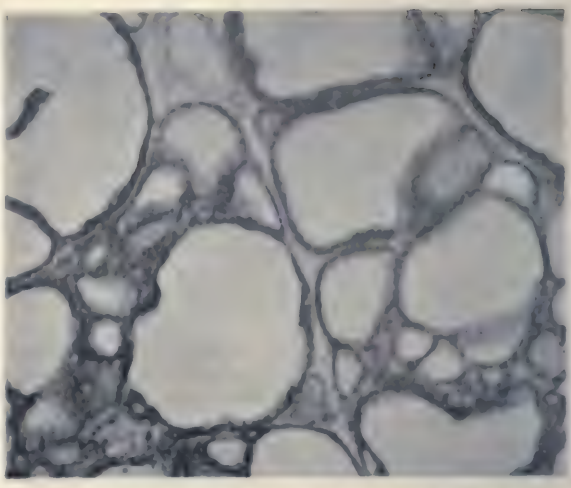


Fig. 1. Large follicles lined with cuboidal epithelium and sprig like processes projecting into the lumen of a follicle, five days after unipolar ligation.

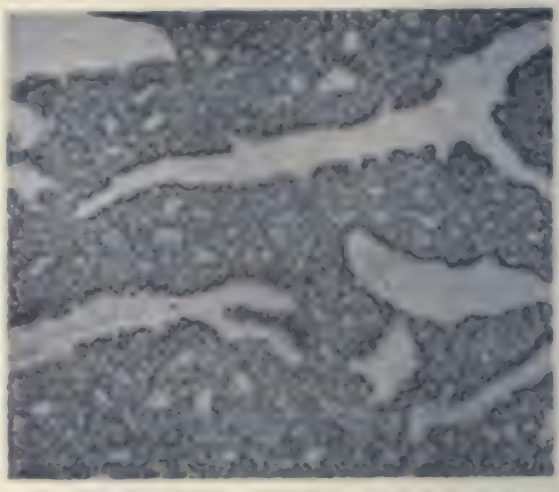


Fig. 2. High columnar epithelium lining the follicles of the unligated pole. Compare with Fig. 1.

tendency of the lumina of the follicles to be large and filled with colloid. The portions of the gland for the entrance of the ligated vessels was surprisingly free from these changes and apparently more active, as shown by the marked parenchymatous hypertrophy (Figs. 1 and 2).

The frequency of the involution forms is shown in the table.

Definite involution changes were found in thirty-five of fifty cases (70 per cent). No relationship between the time of ligation and the time of partial thyroidectomy was demonstrable. In the clinical course of the condition it was found that definite

Type of ligation	Involution changes			
	Cases	Marked	Slight	Indefinite
Unipolar	15	10	1	4
Bipolar	20	14		6
Trigonal	12	5	3	4
Quadripolar	3	2	—	1

clinical improvement and a lowering of the basal metabolic rate occurred more frequently when definite involution changes were demonstrable in the ligated poles.

Tarnauceanu: Goetsch's Test and Radiotherapy in Diseases of the Thyroid (Épreuve de Goetsch et radiothérapie dans les affections du corps thyroïde). *J. de radiol. et d'électrol.*, 1922, vi, 501.

Although amelioration of the symptoms in exophthalmic goiter is proof of the efficacy of radiotherapy, the radiologist has no guide in regard to the time at which each treatment should be stopped. To obtain such a guide the author tried the Goetsch test for hyperthyroidism, described first in 1918, viz., the subcutaneous injection of 5 c.cm. of adrenalin solution. The only modification made by Tarnauceanu was the use of 1 c.cm. of solution instead of 5 c.cm. This test he has applied to all patients who have come to him for roentgen treatment for disease of the thyroid. Cases are classified as follows:

1. Cases of true exophthalmic goiter with a positive Goetsch test prior to treatment, which were so benefited by radiotherapy that after the treatment the Goetsch test was negative or only feebly positive.

2. Cases in which, after improvement following radiotherapy, there was a relapse, the Goetsch test again becoming positive.

3. Cases undergoing treatment by radiotherapy in which the Goetsch test was negative.

4. Cases not having radiotherapy and with a negative Goetsch test.

From his findings in these cases the author comes to the following conclusions:

1. By the objective and functional disturbances which it provokes the Goetsch test gives information regarding hyperfunction or dysfunction of the thyroid gland.

2. It allows the radiologist to make a selection of patients with diseases of the thyroid and to separate those amenable to radiotherapy from those who should be treated by other methods.

3. The Goetsch test is a rational biological test which indicates to the radiologist when the treatment should be stopped.

4. After the completion of radiotherapy the test makes it possible to keep the patient under observation as it must be periodically repeated. It will reveal even the slightest tendency to relapse so that treatment may be renewed before the symptoms become fully apparent. W. A. Brennan.

White, P. A.: Surgery of the Thyroid Gland. *J. Iowa State M. Soc.*, 1923, xiii, 11.

Surgery, X-ray, and radium, in conjunction with rest and palliative medication, are the only measures in goiter treatment which have survived the test of time.

Plummer divides goiters into three types: colloid, adenomatous, and exophthalmic goiter.

Colloid goiters are not surgical, and should not receive X-ray or radium treatment. They may be prevented by giving iodine and three-fourths of them can be reduced by the administration of iodine or thyroid products. They are symmetrically enlarged, feel soft and granular, and microscopically show dilated acini filled with colloid material and lined with flattened epithelium. The basal metabolism is normal. This type of goiter probably never occurs in persons over 35 years of age, but is common during adolescence, especially in girls, often appearing at or following puberty and usually disappearing before the age of 25.

The adenomatous goiter is a surgical condition, but should not be operated upon before the patient's growth is completed because it seldom becomes toxic during adolescence, the thyroid gland is greatly needed at this period, and immature adenomata may be left to develop later. After growth is complete, the adenomata may be removed, whether they are toxic or not, because of the danger that they may become toxic. They occur most commonly in middle life, but may appear during adolescence, becoming prominent only when the colloid material subsides. Adenomata are irregular and nodular; their consistency depends on the degenerative process present. Those of the fibrous and calcareous types are hard, while those of the colloid, cystic, and hæmorrhagic types are soft. Microscopic examination shows the adenomata to be encapsulated by normal thyroid tissue. The acini of the adenomata may be fetal or adult in type and may contain large quantities of colloid material. Toxic adenomata show no hypertrophy or hyperplasia of the acinal epithelium. Toxicity is due to degenerative products. The average age at which toxic symptoms appear is 43 years. At first the toxicity is mild, but it gradually increases. It exerts a selective action on the heart and blood vessels, causing such symptoms as an irregular pulse, attacks of tachycardia, hypertension, and later myocardial degeneration, dyspnœa, and œdema. Tremor, moist and flushed skin, and loss of weight and strength are noted. The metabolic rate is increased, but does not reach the height of the rate in exophthalmic goiter. Exophthalmos is absent. There does not seem to be any rational basis for X-ray or radium treatment. After operation the metabolic rate usually becomes normal.

Exophthalmic goiter may occur at any period of life. It has been found in children under 10 years of age and in persons nearly 60 years old. The symptoms are tachycardia, a flushed moist skin, tremor, and loss of weight and strength, which appear early

and progress rapidly. Exophthalmos develops in the first few months in 50 per cent of the cases and during the first two years in 90 per cent. The pulse is rapid but regular until myocardial degeneration occurs late in the disease. There are remissions and exacerbations of the condition. The gland is symmetrically enlarged, feels quite hard, and microscopic examination shows that the acinal epithelium is hypertrophied but that very little colloid is present.

The rapid, often explosive development of exophthalmic goiter carries a menace to life and entails rapid degenerative changes in vital organs. The natural course of the disease and each exacerbation hastens dissolution or chronic invalidism. If there is doubt as to the patient's tolerance of thyroidectomy a preliminary superior polar ligation will give a test. If the patient cannot withstand thyroidectomy, a second ligation will modify the crisis so that operation may be performed three or four months later. In thyroidectomy for exophthalmic goiter, all but the posterior capsule of one lobe, the isthmus, and part of the other lobe should be removed. One-sixth of a normal lobe will maintain thyroid function. Myxœdema following thyroidectomy is a rare condition. After surgical treatment of exophthalmic goiter, including late and severe cases, over 64 per cent of the patients are free from all evidence of hyperthyroidism, and 13 per cent are markedly improved, making approximately 80 per cent of excellent results after six years.

Those who use the X-ray and radium are in many cases making premature and extravagant claims for the treatment of exophthalmic goiter, but some of the work merits consideration. However, it is not known that a large enough number of patients will escape subsequent exacerbations and consequent visceral damage to offset the known defects in this method of treatment.

Goetsch gives the X-ray a place in the treatment of mild cases and in the preparation of severe cases for surgery, but warns that its use may cause the loss of valuable time with great increase in the surgical risk. Jones states that the benefit of X-ray treatment should be estimated and controlled by basal metabolism tests. Holmes points out the dangers of myxœdema from heavy or prolonged X-ray dosage.

Equally good results should be obtained by radium as with the roentgen ray.

WALTER C. BURKET, M.D.

Mastin, E. V.: The Blood Supply of the Thyroid Gland and Its Surgical Significance. *Surg., Gynec. & Obst.*, 1923, xxxvi, 69.

A detailed study of the blood supply of the thyroid gland was made by injecting autopsy specimens with a barium carmine gelatin mixture. Injections into the superior or inferior artery on one side invariably forced the mixture out of the corresponding vessel on the same side. In a number of instances the injected material also appeared in the vessels of the opposite side.

The principal arterial trunks ramify on the surface of the gland within the true capsule and anastomose freely with one another. The superior thyroid artery is very constant in division and distribution, generally dividing into three branches. The inferior thyroid artery divides into two or more branches at varying distances from the gland.

As a rule the arteries in the substance of the gland are accompanied by two veins, which join at various points. These veins follow the course of the arteries closely and at different points empty into the larger veins that emerge from the interior of the gland and anastomose freely on the surface.

The individual vessels are larger in cases of colloid goiter than in cases of exophthalmic goiter. Because of the vascularity of most exophthalmic goiters this observation appears to be paradoxical, but is explained by the multiplicity of small vessels found in hyperplastic thyroids.

Hæmorrhage after operation, which is now uncommon, generally occurs from a few hours to seventy-two hours later, and usually from an inferior thyroid vein or a branch of the inferior thyroid artery. Hæmorrhage after the third day is extremely rare and always the result of infection.

The following conclusions are drawn:

1. The thyroid has a very rich arterial and venous blood supply.

2. There is an extensive anastomosis not only between vessels of the same lobe, but also between those of opposite lobes.

3. If all four thyroid vessels are ligated, the circulation may be reëstablished through extraglandular anastomosis.

4. The secretory activity of the thyroid gland is under nerve control.

5. After ligation of the superior thyroid artery a polar ligation should be made in order to cut off the veins and lymphatics and the remaining nerve filaments.

6. Hæmorrhage is best controlled by interrupted mattress sutures placed through the remaining gland tissue, by ligation of all bleeding points, and by the use of gauze packing in the wound if necessary.

7. Bleeding veins can often be demonstrated by having the patient strain or cough before the wound is closed.

Sacki, F.: Tetany After Hemistrumectomy (Tetanie nach Hemistrumektomie). *Med. Klin.*, 1922, xviii, 1145.

A case is reported in which, in 1910, a hemistrumectomy on the right side was done. Recently the remaining left half of the goiter is believed to have become somewhat larger. In the past few weeks the patient has frequently noticed a tingling in the hands. In February, 1922, there was an attack of tetanic convulsions, positive Chvostek I and II,

which lasted for twenty-five minutes. On further examination the Trousseau phenomenon was strongly positive after one minute and the electrical excitability (Erb's phenomenon) was found moderately increased. CaCC occurred with a current of 0.5 ma., AnOC with 1.5 ma., AnCC with 5.0 ma., and CaOC with 4.0 ma. (ulnar nerve).

Calcium therapy was extremely effective. Hecalcin (10 and 20 per cent) was given every second day in doses of 10 c.cm. The attacks ceased after the first week of treatment but occasionally there was slight paræsthesia in the hands. In the fourth week the galvanic hyperexcitability reached the following values: CaCC with 1.0 ma., AnCC with 1.5 ma., AnOC with 4.0 ma., and CaOC with 6.0 ma. The Chvostek phenomenon was obtainable only during the attacks.

This case shows that the possibility of a predisposition to tetany must be taken into consideration even after an apparently successful hemistrumectomy, and that attacks of tetany may occur even after a period of years. FISCHER (Z).

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Whittemore, W.: Two Unusual Cases of Empyema. *Surg. Clin. N. Am.*, 1922, ii, 995.

The author presents two cases of double unilateral empyema cavities. In the first case there was an encapsulated empyema cavity in the apex, and another at the base of the right lung. Pus from one cavity contained pneumococci, while that from the other showed streptococci. In the second case the fluoroscopic examination revealed two areas of encapsulated fluid with gas above the fluid level. At operation these cavities were found to be connected by a sinus. The patient developed a staphylococcus septicæmia but recovered.

RALPH B. BETTMAN, M.D.

Hedblom, C. A.: Recent Progress in the Treatment of Chronic Empyema. *J. Iowa State M. Soc.*, 1923, xiii, 21.

According to the author, "dealing with the conditions which predispose to or maintain chronicity, and the adaptation of the antiseptic solution irrigation to its treatment, constitute the essentials of real progress in the treatment of chronic empyema." The most common causes of chronicity are faulty drainage, dense adhesions due to delayed diagnosis, tuberculous infection, bronchial fistula, foreign bodies (for example, lost drainage material), and certain constitutional conditions apparently associated with inability to cope with the infection. Actinomycosis, pulmonary fibrosis occurring during the collapsed state of the lung, and empyema following complete collapse are rare causes.

In some cases a cure is now effected without operation, and in many with only a minor operation. When radical measures are necessary, preliminary complete sterilization of the field preventing postoperative infection can be accomplished by irrigation with Dakin or hypochlorite solution. For the best results, the content of free chlorine, the active principle in Dakin's solution, should be between 0.45 and 0.5 per cent.

The author describes the simple technique employed at the Mayo Clinic, which usually results in reducing the empyema cavity to a capacity of 50 to 100 c.cm. If the residual cavity has a capacity of more than 100 c.cm., decortication should be performed, but in cases of long-standing, and in those in which the cavity is shallow, permitting only slight expansion of the lung, a rib resection should be performed and followed by further irrigation. If the cavity has a capacity of less than 100 c.cm. a rib resection is performed, and the parietal pleura is excised if it is very thick and rigid.

Another successful method, used by Keller, consists in preliminary rib resection and irrigation of the cavity with hypochlorite solution until seven successive sterile cultures are obtained from smears from the depths of the cavity, the soft tissues then being mobilized and sutured in layers.

When a large bronchial fistula is present, open drainage is usually indicated instead of the use of hypochlorite solution by the closed method. The treatment varies according to the type of case.

Jepson, W.: Tumors of the Breast. *J. Iowa State M. Soc.*, 1923, xiii, 4.

The United States mortality statistics for 1920 show 72,931 deaths from cancer, of which 6,437 (8.8 per cent) were due to breast carcinoma. Ninety-three were due to cancer of the male breast. Of Halsted's 210 cases operated on for breast carcinoma, eighty-nine (42.4 per cent) were cured. Walther's statistics from the Paris hospitals give 52 per cent of cures after three years, and Le Dentu's statistics give 47.5 per cent of cures after four years. Of Halsted's 210 cases, 52.4 per cent had involvement of the axillary lymph nodes and 71.4 per cent involvement of both the axillary and cervical lymph nodes.

Women come late for treatment because of lack of familiarity with the symptoms. The senescent woman may know of a tumor in her breast and suspect its character, but shrink from operative interference through fear that it will be of no avail because she has known of one or more of the 50 per cent of patients not saved by the operation. Every failure to cure by operation prevents one or more from seeking timely aid. Some women are deterred from seeking operation through fear of the magnitude of the operation or misconception of the function and importance of the breasts.

In the author's opinion the senescent woman's breast should be regarded as a useless area of integument harboring all the dangers of malignancy and its removal implies no loss of function or any danger greater than that associated with the excision of a similar area of integument elsewhere. Therefore in a case of tumor of the breast removal of the breast should not be delayed until a positive diagnosis of malignancy can be made.

The classification of breast tumors is based on the histopathology and necessitates examination of the tumor itself. This classification may not be differentiated by physical and clinical records alone. However, a tentative pre-operative diagnosis must be made from the physical characteristics, the clinical history, and the patient's age. As a rule the inflammatory conditions, breast hypertrophy and benign tumors, such as fibroma, adenoma, and fibro-adenoma may be differentiated on this basis. Occasional mistakes are made. Benign growths usually appear in the precancerous age and are encapsulated, freely movable, generally painless, and slow growing.

Papillary intracystic fibro-adenoma or cystadenoma is more confusing because it usually develops after the menopause, and malignant forms are relatively frequent. It is single, globular, freely movable, slow growing, and often accompanied by a serous or bloody discharge from the nipple. It consists of papillary out-growths from the walls of a large duct. If the growth and discharge do not cease or the tumor does not remain freely movable, it should be treated as if it were malignant. Mixed tumors occurring after the age of 40 should be regarded with suspicion. The formation of adenomatous cysts and papillomatous growths in the cystic mastitis of senility must be considered abnormal. Chronic mastitis begins as a benign condition. It is not yet known whether it predisposes to cancer. Bloodgood had two cases of cancer in 329 cases of chronic mastitis; Spee found 15 per cent in 295 cases; Ewing discovered precancerous changes in nearly 50 per cent of cases of cystic disease of the breast; and Schimmelbusch considered the condition as only a transition stage to carcinoma.

The author states that if the growth is considered benign, it may be left undisturbed or removed locally and sectioned for study. The complete operation may be done if there is any indication of malignancy at the time of local removal or later if such evidence is found in the study of the tissue. If the growth is a borderline condition the patient may receive the benefit of the doubt, the growth being treated as if it were benign. The author does not use the microscope as an aid at the time of operation.

A cancerous breast should be removed completely with the axillary lymph nodes and with the pectoral muscles if they or their sheaths show any indications of involvement. X-ray and radium treatment may be added. The improvement in results justifies the radical operation.

The hope of the future lies in the prevention or the early recognition of the growth. The author believes that the time may come when there will be serious consideration of the removal of all useless structures when they harbor such dangerous elements as are harbored by the senescent breast.

WALTER C. BURKET, M.D.

Strobell, G. W.: Remarkable Freedom from Local Recurrence Following Chemical Removal of an Advanced Cancerous Breast. *N. York State J. M.*, 1923, xxiii, 27.

Because of the fact that skin cancers, including rodent ulcer, prickle- and squamous-cell epitheliomata, keratoid growths, pigmented warts, etc., which have not penetrated the deep fascia, may be removed without return, the author concludes that the development of an enlarged technique would bring larger masses under control.

Chemical removal consists in the radical and more or less rapid destruction and removal of malignant tissues by means of caustic agents, principally potassium hydroxide and zinc chloride. Care must be taken not to destroy bony structures or to penetrate the pleural cavity.

Potassium hydroxide, rapidly dehydrating and deliquescent, destroys all tissues with which it comes into contact. In breast cases it is employed for the first stage to denude the mammary gland tegmental and fascial tissue layers rapidly and to remove the nipple structures. It is employed also to destroy axillary metastatic lymph glands. It is applied for one hour with the patient under the influence of morphine hyoscine. Its action may be stopped almost instantly by water.

The second stage of gross removal in breast cases is accomplished with zinc chloride which causes a gradual and painless necrosis of all tissues. The blood and lymph vessels are thrombosed. The tissues undergo discoloration, becoming pearly white and then shading into dark gray and black. The consistency of the devitalized tissues varies from that of green-tanned hides to that of soft and hard-sole leathers. Necrosis may extend to the depth of 1 to 2½ cm. after a single application. The dead tissues may be pared away from day to day, following re-application of the zinc, until a general level is reached. The final plaque is left to slough out, a process accompanied and facilitated by an intense inflammatory reaction of the adjacent tissues. Care is taken to prevent contact of the zinc solution with the skin as this causes pain. Water will readily wash the zinc off and relieve the pain. Eventually the granulated surface is covered with a Thiersch skin graft to prevent cicatrization.

The author has treated by this method sixty-one inoperable cancers of the breast. In forty cases previously reported there was no operative death, shock, or hæmorrhage. The average length of life after operation was two and one-fourth years. Six patients are still alive and free from recurrence; three of these have lived more than seven years

after the operation, and the other three, five and one-half years, four years and seven months, and four and one-half years respectively. In 75 per cent of the cases there was no recurrence at the time of death. Internal metastases were present in all cases as evidenced by the axillary, clavicular, and mediastinal lymph glands.

The author concludes that early radical removal, before the axillary glands are involved, should give a permanent cure; that the earlier the chemical treatment, the simpler, more expeditious, and more effective it will be; and that when it is applied to advanced, broken down conditions, the method is superior to every other method hitherto employed, as regards both palliation and freedom from recurrence. WALTER C. BURKET, M.D.

Lee, B. J.: Results and Technique in the Treatment of Carcinoma of the Breast by Radiation. *Am. J. Roentgenol.*, 1923, x, 62.

The author has had the opportunity to observe a large number of primary operable and inoperable and recurrent carcinomata of the breast, some of which were treated by operation plus irradiation and others by irradiation alone. All of the cases have been closely followed.

The technique used in the application of both radium and the roentgen rays has been varied from time to time. The roentgen ray was used routinely for pre-operative treatment before a radical operation, one complete cycle of about four treatments being given over the entire breast and the axillary and supraclavicular regions. Following operation, after the wound had completely healed (usually in two or three weeks), two complete roentgen-ray cycles covering the entire breast and areas of lymphatic drainage were usually given. Breast carcinomata have been treated with radium by one of five methods or a combination of them, namely: pack, tray, dental mold, the insertion of bare emanation tubes, and the insertion of platinum needles containing radium emanation.

With regard to the results obtained in cases of primary operable carcinomata treated by pre-operative roentgen irradiation, radical removal, and postoperative roentgen therapy as described no definite information is given but the belief is expressed that such treatment is of value. The result obtained in primary inoperable cases appears to be a prolongation of life. In recurrent inoperable carcinoma of the breast treatment by radiation offers practically the only hope of checking the disease or effecting a cure. In the treatment of these cases the roentgen ray has been employed most frequently, and the radium pack or bare radium tubes have been used in well-localized, sharply defined recurrent masses. In comparing a series of recurrent cases covering a period of three years with those of another New York hospital in which no radiation was used after operation or for recurrence, it was found that the period of life following recurrence was three times as long when irradiation was used as when it was not employed. Without doubt, the treatment of recurrent cases by radiation gives a marked prolongation of life. The following conclusions are drawn:

All in all, the outlook in the treatment of carcinoma of the breast by radiation is most encouraging. In no case treated by surgery can the proper use of roentgen radiation be discarded. Radiation properly administered is the most effective aid in the care of carcinoma of the breast surgically treated; and in every surgical clinic a pre-operative and postoperative cycle should be employed.

For primary inoperable and recurrent cases the best method at present is external radiation with the roentgen ray, with a fifteen-minute exposure, a 10-in. spark gap, a 12-in. focal distance, 4 mm. of aluminum filtration, and 4 ma. of current, followed by the implantation into the growth of bare radium tubes, a complete dose being given at the first sitting. ADOLPH HARTUNG, M.D.

TRACHEA AND LUNGS

Lehrnbecher, A.: The Operation for Traumatic Hernia of the Lung (Zur Operation der traumatischen Lungenhernie). *Zentralbl. f. Chir.*, 1922, xlix, 1408.

In the case of a man 27 years of age who was stabbed, suture of the lung after resection of a piece of the eighth rib 5 cm. long was necessary to arrest the hæmorrhage. Six months later a pulmonary hernia as large as a child's head developed at this site. At operation, the lung was found adherent to the opening in the thorax but not in the hernial sac, and was easily separated.

To close the hernial ring, a mattress suture was first applied at the base of the hernial sac and the latter then formed into a pad by a continuous purse-string suture and fixed at the site of the suture. Periosteal flaps with long broad pedicles were then made from both of the adjoining ribs, reflected upward and downward, respectively, and united by sutures. A large, free, transplanted flap of fascia from the fascia lata was then applied over this and the muscles and skin were sutured. Primary healing of the wound followed. Three months after the operation the hernia was completely closed off and the patient was free from symptoms.

VON TAPPEINER (Z).

Cutler, E. C.: The Etiology of Postoperative Pulmonary Complications. *Surg. Clin. N. Am.*, 1922, ii, 935.

Cutler discusses the various theories regarding postoperative pulmonary complications and points out that such sequelæ follow operations in two anatomical fields: (1) the abdomen; and (2) the mouth, face, and neck. Their incidence bears no fixed relationship to the anæsthetic used. In abdominal operations pulmonary complications follow the use of local anæsthesia quite as frequently as they follow inhalation anæsthesia. In operations

about the face and neck it would seem that there are fewer complications following the use of local anæsthesia but this is due to the fact that local anæsthesia is not used in infected cases. The morbidity following gas-oxygen anæsthesia is fully as great as that following ether anæsthesia.

Cutler believes the term "ether pneumonia" is erroneous as aspiration plays little if any part in postoperative pulmonary complications. He calls attention to the fact that such complications occur with equal frequency in rich and poor, in persons with perfect teeth, and in those with carious teeth, and are not eliminated by the expert anæsthetist. He believes that the majority of postoperative pulmonary complications are due to embolism resulting from conditions for which the anæsthetist cannot be held responsible.

WILLIAM E. SHACKLETON, M.D.

Heuer, G. J., and MacCready, P. M.: Lung Abscess. *Arch. Surg.*, 1923, vi, 337.

The authors summarize the Johns Hopkins Hospital records of lung abscess. Of sixty-two cases fourteen were not diagnosed during life. In forty-three cases operated upon there were thirteen deaths, an operative mortality of 30 per cent. The total mortality was 44 per cent. Two patients treated by lobectomy died. The authors state that undoubtedly at the present time surgery gives good results only in cases of single well-circumscribed abscesses in which the primary condition responsible for their development has disappeared. Twenty-one such cases were treated by drainage, surgical in twenty-four cases and artificial pneumothorax in five cases. There was one death from spreading gangrene of the lung. The late results in the cases followed were very satisfactory. Long-standing chronic lung abscesses with thick walls of fibrous tissue are often not cured by drainage operations.

In thirty-one cases the abscesses followed pneumonia, in sixteen they developed after an operation (four were tonsillectomies), in seven cases they were due to an acute abdominal infection, and in the remaining eight they were of various origins.

R. C. WEBB, M.D.

Lockwood, A. L.: Lung Abscess. *Arch. Surg.*, 1923, vi, 314.

Contrary to the opinion of the early writers that abscess of the lung is a common sequel of lobar pneumonia, a survey of the cases reported during the last century indicates that it is rare.

By lowering the resistance in the lung tissue itself, lobar pneumonia, bronchopneumonia, and influenzal pneumonia favor the development of lung abscess following pyogenic infection.

Lung abscess occurs most often between the ages of 25 and 40 years. It is three times as common in males as in females, and occurs two and one-half times as often on the right side as on the left, and about twice as often in the lower lobe as in the upper. In three of every four cases it is peripheral and involves the pleura, and in one of four there are multiple abscesses.

Numerous lung abscesses have been caused by neglect or mismanagement on the part of nose and throat surgeons, oral surgeons, and dentists. Such mismanagement or neglect is manifested in the selection of the anæsthetic, in not keeping the patient's head low, and in not taking sufficient precaution to prevent the inhalation of foreign matter. Such a sequel may be prevented by employing a local anæsthetic whenever possible in surgery of the mouth, nose, and throat, and in teeth extraction, by keeping the head low during such operations, if a general anæsthetic is employed, until the patient has thoroughly awakened; by taking special care to prevent the accumulation of blood and mucus in the throat; and by obtaining better hæmostasis in such work.

The diagnosis depends on the history, the amount and nature of the sputum, and the findings of the roentgen-ray and physical examinations.

A study of the results in these cases has led the author to conclude that surgery should not be employed as soon as the diagnosis has been made unless it is definitely indicated. In many series of cases the mortality has been unnecessarily high. Instead of operation, thorough medical treatment with postural rest and drainage should be instituted. When this fails, pneumothorax should be produced in selected cases, surgery being reserved for those which do not respond to the two other methods. The exploratory needle should not be employed.

When surgery is decided on, paravertebral and local anæsthesia, with gas and oxygen if necessary, should be used, and in the majority of cases a more deliberate extensive and logical operation should be planned than resection of the chest wall over the suppuration and cautery or blunt puncture of the abscess.

If the patient's condition is such that extensive operation would involve too much risk, resection, blunt puncture, and exploration of the abscess with the finger should be the limit of surgical interference.

The surgeon, physician, and roentgenologist should be closely associated in making the diagnosis and in the care of these cases.

R. C. WEBB, M.D.

Meyer, W.: The Establishment of a Temporary or Permanent Pulmonary Lip Fistula in the Conservative Treatment of Advanced Bronchiectatic Lung Abscess. *N. York M. J. & Med. Rec.*, 1923, cxvii, 7.

In the operation described the largest cavity is opened through the chest wall and free drainage and ventilation of the cavity are established. The ventilation of the cavity in a great measure stops the foul-smelling sputum. The oxygen prevents the growth of the semi-anaerobic bacteria which settle in these cavities and which may be responsible for the odor of the sputum. After operation the patient's health is greatly improved.

So far, the author has not had the opportunity to close the established fistulæ. In two of his cases closure has occurred spontaneously and the condition may be regarded as completely cured. As long as the fistula remains patent the patient must observe certain precautions, one of these being to avoid bathing or submerging the fistula in water.

RALPH B. BETTMAN, M.D.

Lemon, W. S.: The Interrelationship and End-Results of Chronic Suppurative Diseases of the Lung. *Arch. Surg.*, 1923, vi, 443.

The author classifies the end-results of acute and chronic disease of the lungs as follows: (1) resolution to normal conditions, (2) fibrosis, and (3) necrosis. Empyema, bronchiectasis, and abscess constitute the suppurative type of pulmonary disease. Acute pulmonary diseases which proceed into chronic disease are classified into seven groups:

Group 1. Acute fulminating inflammations, which may be caused by irritating gases. These rapidly fuse with later groups unless death ensues.

Group 2. Acute streptococcal bronchopneumonias, common during the epidemic of influenza.

Group 3. Less acute, but almost as often fatal, pseudo-lobar pneumonia, also of streptococcal or pseudo-streptococcal origin.

Group 4. Pneumonia progressing to the formation of free or interlobar encysted empyema. In this group are the greatest number of cases of long-standing conditions.

Group 5. Abscesses of the unilocular or multilocular type or acute bronchiectasis. Included in this group are abscesses of embolic origin and the aspiration type of bronchiectatic abscess.

Group 6. Residual inflammation which develops into chronic non-tuberculous infection of the lungs or into frank bronchiectasis.

Group 7. A resolving condition, gradually reverting to normal.

There are five reasons for the chronicity noted in Group 4:

1. The treatment of tuberculous empyema by open methods or methods designed for the treatment of non-tuberculous forms.

2. The fact that the sinus itself may lead from infected tissue, may have thickened walls, and may remain open indefinitely.

3. The presence of an infected rib at the base of the sinus, and osteomyelitis.

4. Insufficient drainage.

5. Improper position of the surgical wound.

As all purulent effusions tend to form adhesions and air and transudates do not, pockets are formed, the pleura is thickened, and the lung does not expand properly to fill the pleural space. Bronchial fistulæ or multiple fistulæ are obvious causes of chronicity.

Fibrosis is one of the end-results of infection and may be of varying degree: (1) fibrosis of the pleura associated with fibrosis within the lung; (2) fibrosis extending from the hilum, and (3) fibrosis within the lung and proceeding throughout the interlobular septa, or around the bronchi and vessels, or in the alveolar walls. Whether it is tuberculous or non-tuberculous, fibrosis is one of the agencies which cause changes in the position of the mediastinal structures, the most obvious of which are the heart and trachea.

If there is fibrosis with persistent cough, bronchiectasis must always be reckoned with; first, because the strength-giving wall of the bronchus, which often has been weakened in the original disease of the lung, gives way under the added pressure due to cough, and second, because in the fibrous lung the damaged bronchus has lost its normal elastic support and dilates when the interbronchial pressure is raised (McPhedran). This result is more apt to follow when the pleura anchors the lung to the chest wall, a condition present in the majority of Lemon's cases of bronchiectasis. Two other factors may enter into bronchiectasis: viz., traction on the bronchi from inspiratory movements of the thorax, and an increase of endobronchial pressure associated with effort in coughing.

Bronchiectasis following influenza does not develop for six months or a year after the acute illness.

Norris and Landis state that pulmonary fibrosis and bronchiectasis are due to the same cause. The bronchi were dilated in about 80 per cent of the cases of massive fibrosis.

Lemon emphasizes the importance of recognizing the relationship between abscess and bronchiectasis because bronchiectasis may develop during the healing of an abscess, and as patients with bronchiectasis are prone to infection, abscess or bronchopneumonia may develop.

Amyloidosis or tuberculous meningitis must be taken into consideration in operative procedures causing collapse of the lung in cases of unilateral tuberculosis, particularly if the disease has been of long duration. Lemon reports a case to illustrate the difficulty in the diagnosis in long-standing, chronic pulmonary suppuration, and the benefit which can be obtained by surgical intervention. The patient had had influenza three years previously, during a time when the scarcity of physicians in his outlying country did not permit him to have careful attention. The history and examination indicated that influenza complicated by bronchopneumonia was followed by empyema. The empyema cavity had formed a fistula with the bronchus, and as a result there was continuous expectoration of large amounts of purulent material. The patient was a wheel-chair invalid with chest deformity and an extreme grade of arthritis and pulmonary osteo-arthropathy.

This case illustrates the principle that if patients continue ill when their primary infection should be over, it must be assumed that they are suffering from a suppurative disease which should be attacked at once. The peculiar deformities of the extremities, varying from all degrees of simple clubbing or hippocratic deformity to true pulmonary osteo-arthropathy, are one of the interesting accompaniments of suppurative disease of the lung. Abscess

of the lung resulting from pneumonia represents the patient's failure to react effectively.

A subgroup of cases of suppuration of the lung are classified as non-tuberculous infections; these have been studied recently by Conner in the Section on Diseases of the Chest in the Mayo Clinic. The conclusions drawn are as follows:

1. Non-tuberculous infection of the lung is a non-specific disease but deserves a name as a separate disease entity.

2. The essential features are cough, marked chronicity, exacerbations, little or no fever, and a few other constitutional symptoms, usually purulent expectoration, lack of progression, and location of the lesion almost always in the bases.

3. The principal physical sign is moist râles.

4. The diagnosis is based mainly on the chronicity of the cough, the slight effect on the general health, the location of the signs in the bases, and the persistent absence of the bacilli of tuberculosis.

5. In the differential diagnosis, chronic bronchitis, tuberculosis, frank bronchiectasis, and bronchopneumonia must be considered.

6. The prognosis must be guarded in the cases of adults.

7. The treatment is mainly postural treatment.

Ringer, P. H.: Reflections upon Nine and One-Half Years' Experience with Artificial Pneumothorax. *N. York M. J. & Med. Rec.*, 1923, cxvii, 14.

Artificial pneumothorax is now being used in milder cases than formerly, and in many hopeless cases it is employed as a purely palliative measure. Cases of apical involvement have a better prognosis than those in which the base of the lung is involved because in the former partial collapse is more often possible. Cases of profuse hæmorrhage give at times the most brilliant results.

Atmospheric air is now used exclusively, and it has become customary to refill at shorter intervals and with less massive doses. The use of high pressure to tear adhesions is dangerous.

Accidents incident to artificial pneumothorax are becoming less common. It has been definitely established that partial collapse is productive of good results. Bilateral compression is not a justifiable procedure. The most frequent complication is fluid. Fluid is dangerous because it favors gradual obliteration of the pleural cavity. Fluid was encountered in about 15 per cent of the author's cases. The appearance of activity or an increase of activity in the uncollapsed lung is not an infrequent complication. When total collapse is possible refilling should be continued for two years. Partial collapse should be continued indefinitely. When collapse has been done for hæmorrhage and the uncollapsed lung is affected, collapse should be maintained only long enough to plug the bleeding point. Although good results may come from artificial pneumothorax in cases of lung abscess, surgical treatment is to be preferred.

"To epitomize briefly the conclusions reached as a result of nine and one-half years' experience with artificial pneumothorax, it can be said that the method is distinctly valuable . . . Immediate results are often surprisingly brilliant; the percentage of really permanent arrests disappointingly small." Of eighty-five patients treated by at least partial pneumothorax only 16 per cent are well and only 13 per cent owe their recovery to the artificial pneumothorax. Thirty per cent have been benefited.

RALPH B. BETTMAN, M.D.

Davies, H. M.: Surgical Treatment in Cases of Pulmonary Tuberculosis. *Brit. M. J.*, 1923, i, 158.

In cases of pulmonary tuberculosis collapse of the lung offers a chance of improvement after medical treatment has failed. When the lung is placed at rest, its resistance to tubercle bacilli is increased and secondary changes, such as bronchiectasis, which in the later stages of tuberculosis may cause the most aggravating symptoms, are sometimes prevented. Surgical collapse is usually indicated only when the lesion is unilateral, but in a few instances the author produced an artificial pneumothorax in the presence of a bilateral lesion, compressing first one lung, then allowing its incomplete re-expansion, and then compressing the other lung.

Adhesions form the chief obstacle to successful collapse by artificial pneumothorax. These are dealt with by various methods, depending on their size, position, etc. Occasionally it may be possible to stretch a thin adhesion by the prolonged use of high intrathoracic pressure. Occasionally also it may be possible to tear an adhesion by high pressure, but this is fraught with the danger of tearing the lung. If the adhesions are very thin and string-like and can be seen readily with the fluoroscope, they may be divided under X-ray guidance by means of a tenotome stabbed through the chest wall. Jacobaeus' method has a limited application.

For dense adhesions holding the upper lobe, extrapleural apicolysis may be performed. Paraffin may be employed to maintain the collapse, but a transplanted fat flap is much better.

The lung may be collapsed also by collapsing the chest wall. The author prefers rib resection with removal of practically the entire rib to rib mobilization in which the anterior and posterior sections of the rib are removed and the ribs are allowed to drop downward or inward.

RALPH B. BETTMAN, M.D.

Schlaepfer, K.: Fibrosis of the Lung Following Ligation of the Pulmonary Artery Combined with Phrenicotomy and Partial Occlusion of the Pulmonary Veins. *Arch. Surg.*, 1923, vi, 358.

The author summarizes the surgical methods at present under consideration for the cure of chronic infectious disease of the lung, particularly tuberculosis. Two methods now widely used in cases of unilateral pulmonary tuberculosis are artificial pneu-

motherax and extrapleural thoracoplasty. These methods act indirectly.

Direct influence on the physiological function of the lung is brought about by ligation of the pulmonary artery of one lung or one lobe. The bronchial arteries furnish a sufficient supply of blood. This procedure may be reinforced by paralyzing the diaphragm or cutting the intercostal nerves. The chronic stasis which results causes replacement of the lung tissue by fibrous tissue.

Phrenicotomy performed at the same time as the ligation is very helpful. The paralyzed diaphragm and the movable mediastinum tend to follow the retracting lung. On the theory that tuberculosis occurs less often in persons with organic heart lesions, partial occlusion of the pulmonary veins is suggested as a further aid. A third method of bringing the lung to functional rest consists in blocking the air passages by blocking the main bronchus with a piece of fascia.

R. C. Wenn, M.D.

HEART AND VASCULAR SYSTEM

Roberts, J. B.: The Value of Pericardiotomy in Diagnosis and Treatment. *Arch. Surg.*, 1923, vi, 101.

In obscure conditions the diagnosis may be established occasionally and permanent relief given with negligible risk by digital exploration of the heart sac. The earliest American operation for suturing a cardiac wound was performed by Stewart. Other investigators have drawn attention to clinical and experimental work in cardiac surgery.

The author has had considerable experience in this line of work. The case which prompted the preparation of this article was that of a boy 7½ years of age whose condition had been diagnosed as pericarditis with effusion. The lungs were negative. The heart showed an increased area of dullness, extending to the nipple line on the right side and beyond the nipple line on the left side. The heart sounds were fairly normal, but an evident to-and-fro murmur was transmitted to the left axilla. The child was admitted to the hospital in July and was under treatment until the following September, when a roentgenogram was made. He was then sent to the laboratory with a clinical diagnosis of pericarditis with effusion and left pleural effusion.

His temperature record for September varied from normal to 99 degrees F., with occasional rises to about 101 degrees F. and occasional decreases to normal. The latter part of September it was decided to tap the pericardium.

Thorough examination revealed rather loud cardiac sounds with dullness in the precordial region, but the patient was not especially cyanotic, and as he lay in bed his pulse was rather strong. Another physician and the author discussed the fact that the clinical examination did not give the impression that the patient was suffering from a large pericardial effusion.

An aspirating needle was inserted between the xiphoid cartilage and the seventh rib, but no fluid was obtained. An incision was then made down through the left fifth interspace, and the pleura and pericardium were exposed. When the needle was again inserted through the exposed pericardium no fluid except blood was obtained. The pericardium was opened by a small incision and the index finger inserted into the pericardial sac. No fluid was obtained but the heart was found to be very large. Under careful treatment the patient improved. This improvement was due evidently to the change in treatment resulting from the correction of the diagnosis and perhaps to relief of pressure on the enlarged heart by the incision in the heart sac which must have enclosed the large heart tightly.

Valuable additional history was obtained after the operation. The child had been taken acutely ill in June, with high fever, general depression, and malaise. He was in bed one week, but then got up and felt better. In July he had an attack of pain in the upper abdomen which was diagnosed as gastro-intestinal colic. His breathing had been rapid. He had never complained of dyspnœa and cardiac pain until then. His tonsils had always been enlarged. Two months after this attack he was operated on for the removal of hypertrophied tonsils and adenoids under ether anæsthesia. His general health then improved markedly from week to week.

This case and other experiences in pericardial surgery have led the author to the conclusion that careful investigation by percussion, auscultation, and roentgenographic study should always be made before resort is had to tapping or other surgical attack. Laboratory research has apparently proved the possibility of entering even the hollow heart and remedying defects of its valvular apparatus.

Diagnostic pericardiotomy should be done between the fourth and fifth or the fifth and sixth ribs. In the fourth space, the middle of the incision should be at a point a little to the right of, and below, the nipple, close to, but below, the upper edge of the fifth rib. An elliptical flap, with its convexity downward, should be turned so as to expose the entire width of the fourth interspace.

If the pericardium is believed to contain pus, a small puncture with the veterinary hypodermic syringe may be made before the pericardium is opened. If pus is found, a new incision may be made nearer the sternum or drainage may be provided in that region to save the pleural cavity from contamination.

Whenever it is necessary to expose the heart for a wound caused by a foreign body, a somewhat triangular osteoplastic flap should be turned up by dividing the fourth and fifth cartilages, the intercostal muscles being used as a hinge, or by the trap door suggested by Delorme.

George E. Bellby, M.D.

Crile, D. W.: Resuscitation: Intracardiac Injections. *Surg., Gynec. & Obst.*, 1922, xxxv, 772.

The author reports the cases of five patients with cessation of the heart beat who were revived by the use of intravenous or intracardiac injections of

adrenalin. Two of the five made an uneventful recovery. In all of these cases other methods of resuscitation were tried without success. The successful method consists in the injection into the heart of 1 to 10 c.cm. of adrenalin (1:1,000) by means of a long spinal-puncture needle. Heart blood must be aspirated to prove entrance into the heart cavity. Speed is important, and the heart must be massaged. The same results may be obtained by intravenous injections. The procedure described is not a substitute for the usual resuscitation measures; it is indicated only after ordinary measures have failed.

MARCUS H. HOBART, M.D.

PHARYNX AND ŒSOPHAGUS

Weiss, E.: Congenital Atresia of the Œsophagus, with Œsophagotracheal Fistula: Report of Three Cases. *J. Am. M. Ass.*, 1923, lxxx, 16.

Plass collected 136 verified cases up to 1917. Since that time, fifteen cases have been reported. Hence the anomaly demands attention because of its frequency.

In the cases reported since 1917 and in sixteen of the 136 cases collected by Plass, gastrostomy proved futile. Death from starvation is certain without operation, and if operation is performed death results from shock, hæmorrhage, suffocation, or bronchopneumonia, the last probably due to regurgitation. Jejunostomy has been tried once without success. Richter treated two cases by gastrostomy plus closure of the lower œsophageal segment but death occurred within twenty hours.

The malformation is practically always the same. The upper end of the œsophagus is usually dilated and ends in a blind sac at about the level of the tracheal bifurcation. The lower end opens into the trachea at or near the bifurcation. Other malformations, such as atresia ani, may be associated with this condition.

The diagnosis is made readily. The child regurgitates almost immediately after taking food. Suffocative attacks attended by choking and cyanosis follow attempts to swallow. The stomach inflates with each inspiration and the breath sounds over the abdomen are more audible than normal. The passing of a catheter into the œsophagus under the fluoroscope and œsophagoscopy make the diagnosis certain.

The author reports three cases, almost identical clinically and anatomically, in which gastrostomy was performed. Feeding through the gastrostomy opening caused choking attacks. The first child died of bronchopneumonia eleven days after the operation; the second, one day after the operation; and the third, three days later. In each case the upper segment of the œsophagus ended in a blind pouch just above the tracheal bifurcation, and the lower œsophageal segment opened into the trachea near the bifurcation.

WALTER C. BURKET, M.D.

Fischer, H.: Surgical Treatment of the Œsophagus. *Arch. Surg.*, 1923, vi, 256.

In its development the surgery of the œsophagus has passed through several distinct stages, viz.: (1) the extrapleural dorsal approach, with attempts to reconstruct the lumen by suture; (2) the transpleural approach under differential pressure, with attempts to restore the tube, with or without transposition of the stomach by suture or buttons of various types; (3) the transpleural removal of the whole œsophagus from an incision in the neck, the stump being placed outside, and later reconstruction of an œsophagus by a plastic operation; (4) extrapleural removal of the entire œsophagus by invagination by a combined method from the abdomen and the neck; (5) extrapleural removal by a combined method from the abdomen or neck or from the abdomen, neck, and back, with transposition of the stomach into the posterior mediastinum.

Fischer admits that at present the results of surgery of the œsophagus are not good; only in cases of carcinoma of the cardiac portion have patients recovered from the operation and have lived. He believes the time is not far distant, however, when conditions of the œsophagus now regarded as hopeless may be successfully attacked.

The article is an excellent summary of the development of œsophageal surgery and is supplemented by an excellent bibliography.

RALPH B. BETTMAN, M.D.

MISCELLANEOUS

Moons, E.: A Dermoid Cyst of the Anterior Mediastinum [Kyste dermoïde du médiastin antérieur]. *Arch. franco-belges de chir.*, 1922, xxv, 959.

Three months after a normal parturition the patient whose case is reported complained of a painful area on the anterior surface of the right chest wall just above the upper surface of the liver. The pain first occurred in attacks lasting two or three days, but later became constant. Coughing, expectoration, and fever were not present at any time. Treatment with tincture of iodine, therapeutic light, and exploratory punctures caused no improvement. The author first saw the patient three years after the onset of the condition, when she had lost considerable weight, appeared cachetic, and complained of pain chiefly in the right anterior axillary line immediately above the upper border of the liver. Respiration was short and difficult but at no time was there an increase in temperature.

Dullness was present over the right chest wall anteriorly as high as the second rib in the mammary line, and posteriorly to the scapula. There was complete absence of tactile and vocal fremitus over this area. Exploratory punctures yielded a straw-colored fluid which at times was tinged a reddish-brown. X-ray examination revealed a dense shadow in the right side of the thorax as high as the second rib and extending to the left beyond the

heart shadow. In an examination with pneumoperitoneum the gas was demonstrated to pass between the upper surface of the liver and the under-surface of the diaphragm. A diagnosis of tumor of the mediastinum was made.

At operation, the third, fourth, fifth, and sixth ribs on the right side were excised. A large cyst containing a large amount of degenerated material and a thick brownish fluid and small secondary cyst cavities were found. The right lung was compressed against the posterior thoracic wall. The cyst wall was dissected free from the costal and sternal pleura, but when the attempt was made to dissect it from the pericardium and large vessels at the root of the lung, profuse bleeding occurred. The cavity was packed tightly with gauze. After a stormy postoperative period the patient recovered. Later the right mammary gland was turned into the thorax to fill the cavity. LOYAL E. DAVIS, M.D.

Lilienthal, H.: Posterior Mediastinotomy. *Arch. Surg.*, 1923, vi, 274.

Lilienthal describes his technique for extrapleural posterior mediastinotomy and reports a case treated in this manner. The case was that of a man aged 43 years who, for two months, had suffered pain in the dorsal region accompanied by cough and expectoration. A diagnosis of tumor of the mediastinum continuous with the lung was made. The specimen removed at operation revealed an interstitial inflammatory process but no evidence of neoplasm. After the operation the local symptoms improved and the wound healed in a few weeks, but the patient developed a left hemiplegia and delirium and died. Autopsy was not permitted. It is probable that death was due to a metastatic cerebral abscess.

The principle of the author's technique is retraction of the divided ends of the ribs at right angles to their long axis, the extent of the available space being determined only by the length of the wound. The patient lies on his right side but turned about 30 degrees to the front. The thighs are flexed, the right arm is placed slightly behind the patient, and the left arm is placed forward and upward. A pillow is used to cause slight scoliosis. The operation is performed under general or local anæsthesia. The author calls attention to the value of differential pressure in case both pleural sacs are accidentally opened. A high and a low procedure are described.

Low posterior mediastinotomy is performed by making an incision on the ninth rib, beginning 8 in. from the spine, extending it along the rib to the edge of the long spinal muscles, and then curving it upward parallel with the spine for five interspaces. The ninth rib is resected subperiosteally, beginning just anterior to the angle and proceeding laterally as far as the wound will permit. The finger is then inserted slowly between the posterior unresected part of the rib and its periosteum and this membrane is peeled forward with the pleura until the eighth rib is reached. When the eighth rib has been freed from the pleura it is divided and retracted and the procedure is continued upward until sufficient space has been gained. The contents of the mediastinum are thus exposed. It is sometimes difficult to recognize the œsophagus but it may be rendered clearly visible by passing a bougie with a small electric lamp in its end which shines through with a bright crimson glow. In exposing the œsophagus one must guard against vagus shock by applying a small pledget of 5 per cent cocaine. The œsophagus may be followed down to where it passes through the hiatus in the diaphragm.

The high operation is carried out in much the same manner but the seventh or the sixth ribs are those first resected, and the fifth, fourth, and third ribs are divided posteriorly. The best approach is from the left side. R. C. WEBB, M.D.

Archibald, E. W., LeWald, L. T., Torek, F. J., and Others: Surgery of the Mediastinum, Including the Heart and Œsophagus: Abstract of Discussion. *Arch. Surg.*, 1924, vi, 289.

ARCHIBALD stated that his experience with the posterior extrathoracoplastic operation in pulmonary tuberculosis numbered fifteen cases with practical cures in from 25 to 35 per cent. He reported a case of carcinoma of the œsophagus just above the arch of the aorta. A gastrostomy was performed and three weeks later he operated for removal of the cancer. He went in from the right side, removing the sixth and seventh ribs. The pleura was difficult to separate. The operation was performed under positive pressure. The pleura was torn in several places and repaired. The adherent tumor was excised. A mediastinitis developed and the patient died on the sixth day. Archibald regards the method used as the only rational procedure but stated that it is often much more difficult than Lilienthal led us to expect.

LEWALD mentioned three cases of what were probably dermoids of the chest. One evacuated spontaneously through the bronchi and trachea. He referred also to a case of rapidly growing lymphosarcoma of the mediastinum. He had under observation a child and a woman whose stomachs were in the thoracic cavity.

TOREK, in discussing carcinoma of the œsophagus, said that improvement in the results depends upon improvement in the technique and early recognition of the condition. The status of diagnosis is that of appendicitis thirty-five years ago. The œsophagoscope should be used more frequently and the condition recognized while it is still confined to the mucous lining. When it is diagnosed early, the likelihood of infection is slight. Torek has not decided whether the transpleural or the extrapleural route is to be preferred.

GRAHAM mentioned the case of a moribund man with a large mediastinal lymphosarcoma completely surrounding the trachea and heart. An emergency decompression was attempted by longitudinal splitting of the sternum. The patient died in half an

hour. Graham mentioned also a case of thoracic stomach in which a diagnosis of empyema following pneumonia was made, a thoracotomy was performed, and the stomach opened and drained. The operation left a discharging sinus through the chest wall. Graham called attention also to the method developed experimentally in his laboratory in which a double cuff of fascia lata is placed about the portion of the œsophagus to be resected in carcinoma and two weeks later the œsophagus and the inner layer of fascia lata are removed, a tube being left for regeneration. The procedure gave fairly good results in dogs.

SCHLAEPFER suggested that a preliminary gastrostomy or jejunostomy combined with X-ray and radium treatment might be advisable before operating on carcinoma of the œsophagus.

MILLER spoke of some experimental work on dogs in which the stomach was drawn into the thorax to replace the major portion of the thoracic œsophagus. He stated that the lower portion of the œsophagus is supplied with a strong layer of submucosa.

YATES reported a disaster following mediastinal decompression. He is in favor of X-ray treatment rather than decompression.

HEDBLOM mentioned a similar experience.

GREEN suggested the injection of aleuronat into the pleural cavity to cause a sterile chemical inflammation and adhesion between the parietal and visceral pleuræ, stating that this might prevent septic pleuritis as a complication of resection of the œsophagus for carcinoma.

MATAS mentioned a case of mediastinal lymphosarcoma in which he made a complete longitudinal division of the sternum as a decompression. The patient died four hours later. The idea of decompression as applied to intrathoracic neoplasms has no analogy in the principle of decompression for the relief of intracranial tension. Morphine and other succedanea give greater relief.

FISCHER stated that he believed he would continue to use the transpleural approach for œsophageal tumors.

LILIENTHAL advised against operating after radium treatment in cancer of the œsophagus on account of the dense adhesions. He stated that for a correct understanding of the relative advantages of surgical procedures we must operate on sick dogs and healthy men. He reported a successful mediastinal decompression in the case of a patient with a large retrosternal goiter. R. C. WEAR, M.D.

Pryor, J. H.: Immobility of the Diaphragm, with Report of Cases of Bilateral Immobility. *N. York M. J. & Med. Rec.*, 1923, cxviii, 75.

This article is based on 145 cases in which there had been pleurisy with effusion or empyema. The interval between aspiration or evacuation and fluoroscopic examination was about a year and a half. The cases are classified as follows: (1) empyema in the child, (2) empyema in the adult, (3) pleurisy with effusion, (4) pleurisy with effusion and clinical pulmonary pneumonia, and (5) pneumothorax and effusion.

From the complete series it was found that the diaphragm remains unimpaired in one of six cases, the same proportion have restricted comparative motion, and in two-thirds of the cases all motion on one side is lost.

Fixation of the diaphragm is not as common in empyema in the child as in the adult. The tendency to more rapid recovery is apparent. Immobility of the diaphragm occurs in 50 per cent of the cases. Incomplete evacuation, undiscovered pockets, premature closure of the opening for drainage, and insufficient attention to expansion of the collapsed lung are the causes of injury to the heart and diaphragm.

In the adult, empyema is a far more serious condition. Of fifty cases observed only eight showed no immobility or injury to the diaphragm. Pericarditis, adhesions between the pericardium and pleura, and twisting of the heart are much more common than is generally believed and explain symptoms and complaints frequently ascribed to other causes.

Purulent pericarditis also occurs but is detected only if an autopsy is performed.

Loss of function of the affected leaflet of the diaphragm is not so common in pleurisy with effusion as in empyema. In about half the cases some motion of the diaphragm remains. The observations in cases of pleurisy with effusion and pulmonary tuberculosis were very similar to those made in uncomplicated pleurisy with effusion.

In pneumothorax with effusion the ultimate results are similar to those of pleurisy with effusion. The author calls attention to the danger of crippling the diaphram in artificial pneumothorax.

Impairment of the movement of the diaphragm may extend to the side opposite that affected by the pleurisy or empyema. There was no compensatory increase in motion of the unaffected side. Symptoms are relatively uncommon, but there may be palpitation, impairment of breathing, neuralgia, and inability to work as before.

Six cases of bilateral immobility have come under observation. All were cases of chronic tuberculosis and all of the patients had had pleurisy. The principal complaint was shortness of breath. The X-ray examination showed flattening of the dome of the diaphragm, the pericardial attachment forming the apex of an inverted V. The heart shadow was long and narrow, its original shape being entirely lost. All of the patients steadily declined and died in a short time. Only one lived for two years. Two of the cases of bilateral immobility were cases in which artificial pneumothorax was employed for treatment.

A syndrome noted in this condition and never observed in any other the author calls "phrenocardiac incompetency." The findings include a distinctive dyspnœa, a decrease in the cardiac area

faintness or absence of the apex beat, faintness of the heart sounds, a very low blood pressure, anæmia, gradual loss of flesh and strength, costal breathing, absence of Litten's sign, and a history of pleurisy and pulmonary tuberculosis.

In such cases one should look for X-ray evidence of bilateral immobility of the diaphragm.

There is diversity of opinion as to the cause of diaphragmatic immobility. It has been ascribed to paralysis of the phrenic nerve, to the pressure of fluid in the pleural cavity, to adhesions, and to inflammation of the diaphragm leading to degenerative changes and fibrotic thickening. In the author's opinion the most probable cause is morbid change in the diaphragm. I. E. Bishkow, M.D.

Whittemore, W.: Teratoma of the Right Chest Cavity: Report of a Case. *Arch. Surg.*, 1923, vi, 282.

The author reports the case of a 15-year-old underdeveloped and under-nourished boy who had had symptoms of tumor in the right side of the chest and bulging of the chest wall for fifteen months.

Operation consisted of resection of the sixth rib for 8 in., section of the fifth, seventh, and eighth ribs near the vertebral column, removal of the tumor, and ligation of the pedicle. The patient recovered.

The tumor was a cystic teratoma the size of a large cantaloupe. It contained bony plates, epidermis, and hair.

The lung showed no tendency to expand

R. C. Webb, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Ellerbroek, N.: The Operative Treatment of Umbilical Hernia (Zur operativen Behandlung des Nabelschnurbruches). *Deutsche med. Wchnschr.*, 1922, xlviii, 1213.

Ellerbroek reports a case of umbilical hernia the size of an apple in which he obtained a successful result by circumcising the skin, opening the peritoneum, replacing the intestines, and suturing the hernial ring. If these herniæ contain the liver and the entire intestine and are associated with malformation of the abdominal wall they may reach a considerable size. For such cases, Ahlfeld has recommended cleansing the hernial covering with 86 per cent alcohol, replacement of the contents, approximation of the recti muscles, the application of a tight abdominal binder to retain the intestines, and the application of alcohol compresses to prevent disintegration. Olsheimer had devised an extraperitoneal operation.

Care is necessary in ligating the umbilical cord for if a beginning hernia of this type is not recognized by the midwife the intestines will also be ligated. Such herniæ of large size may cause difficulties in labor. When the hernia has ruptured and the viscera are displaced, the intestines may be mistaken for the umbilical cord. If a child is born with this condition, the operation described should be done at once after cleansing of the viscera. In one case an operation was performed successfully by Reed in spite of considerable soiling. Vorschuetz (Z).

GASTRO-INTESTINAL TRACT

Alvarez, W. C.: New Light on Gastric Peristalsis. *Am. J. Roentgenol.*, 1923, x, 31.

With the aid of a specially devised apparatus the author has been able to obtain electrogastrograms and mechanograms which have increased our knowledge of gastric peristalsis. Details of most of the experimental work have been reported elsewhere in previous articles.

Methods are now being devised for obtaining multiple and simultaneous mechanical and electrical records of the activities of the stomach and bowel.

A few electrogastrograms of the human stomach have been obtained. The electrograms of the digestive tract closely resemble the corresponding mechanograms.

New evidence has been obtained as to the location and behavior of the gastric pacemaker. Stomach blocks and dissociations have been observed. Cole's discovery of gastric systoles has been confirmed.

Several peculiar types of peristalsis are described, and certain contractions are shown which might be called, by analogy, "pyloric extra-systoles."

Two or three different types of contraction may take place simultaneously in one segment of the stomach as in one segment of bowel.

There is a close relation between the activities of the pyloric end of the stomach and those of the duodenum.

It is hoped that the new studies will eventually help the physician and the roentgenologist to recognize and interpret syndromes in the same way as the polygraph and the string galvanometer have helped the heart specialist to recognize auricular fibrillation or heart block from the history or from the feel of the pulse. Adolph Hartung, M.D.

Apperly, F. L.: The Mechanism of Hyperchlorhydria. *Med. J. Australia*, 1922, ii, 33.

Hyperchlorhydria can be brought about by increased gastric secretion and by increased rapidity of evacuation, but is lowered by an increase of the normally occurring alkaline regurgitation from the duodenum and is due more to failure of the neutralization apparatus than to any other factor.

The opening and closing of the pylorus is a matter of tension on the two sides of the pylorus and some sensory mechanism in the duodenum rather than Canon's law. Rise of gastric tone is brought about by nervous factors. Hyperthyroidism and nerve strain may decrease duodenal tone. Acidity of the duodenal contents may raise the tone.

Actual pancreatic disease or obstruction of the channels by which the juice normally enters the stomach may cause hyperchlorhydria.

The use of 0.4 per cent hydrochloric acid for testing pancreatic juice is under investigation.

The fractional test meal facilitates the study of obscure "dyspepsias." CAROL E. JAMESON, M.D.

Radasch, H. E.: The Distribution of Acid Cells Along the Dorsal Curvature of the Stomach and the Possible Relation to the Occurrence of Gastric Ulcer. *Surg. Gyne. & Obst.*, 1923, xxxvi, 87.

The average distribution of the acid cells along the lesser curvature is 63.09 per cent of the distance from the cardiac orifice. They are found in greatest numbers in the fundus, and are numerous toward the cardiopyloric juncture. Beyond the cardiopyloric juncture they are few and scattered. Along the greater curvature they are found to a point 81.55 per cent of the distance from the cardiac orifice, being numerous in the fundus and ceasing at the cardiopyloric juncture. Along the ventral curvature acid cells extend 76.48 per cent of the distance from the cardiac orifice, and along the dorsal curvature they extend 80.54 per cent of this distance. Here also they are located chiefly in the fundus and do not extend beyond the cardiopyloric juncture.

The thickness of the mucosa in the various portions of the stomach seems to vary in different stomachs.

In conclusion the author states that although there appears to be some relation between the occurrence of ulcers in the different regions of the stomach and the distribution of the acid cells, the evidence is too slight to be conclusive.

J. A. H. MAGOUN, M.D.

Smidt, H.: The Pathological Relationship between Ulcerative Processes in the Stomach and Duodenum and Epigastric Herniæ (Ueber die pathologischen Beziehungen zwischen den ulcerosen Prozessen am Magen und Duodenum und den epigastrischen Hernien). *Arch. f. klin. Chir.*, 1922, cxx, 585.

The relationship between herniæ of the linea alba and the stomach has been recognized for a long time. In epigastric hernia, therefore, an exploratory laparotomy is indicated.

The author has systematically searched for a gastric disorder in every case of epigastric hernia seen during the past two years. In 12.1 per cent of the cases of ulcer in which operation was done a coexistent epigastric hernia was found. On the other hand, 52.3 per cent of epigastric herniæ were associated with ulcerous processes in the stomach or duodenum. Males were affected more frequently than females.

Only a small percentage of the patients had no previous gastric symptoms. A number complained only of pain in the stomach and were unaware of the presence of a hernia. In persons who had no previous symptoms the stomach and duodenum were found intact at exploratory laparotomy. Cases with pronounced gastric symptoms, but in which the exploratory laparotomy revealed nothing but the hernia, were especially interesting.

Exploratory laparotomy is unnecessary only when the ulcer may be definitely excluded by ordinary diagnostic measures. General complaints regarding anorexia, a feeling of pressure, and pain are of value only under certain conditions; very often facts in the history lead to a false diagnosis. On the other hand, the presence of a gastric or duodenal ulcer cannot be excluded on the basis of relatively slight symptoms. As a rule moderate acidity values were found on chemical examination of the gastric contents; hyperacidity was found more often than subacidity. In the cases of hyperacidity the presence of an ulcer appeared probable even from the history, but on the whole, the acidity test could not be relied upon.

Roentgenography was used as a routine and in general its findings were correct. In two cases, however, an ulcer was not recognized, being found only on exploratory laparotomy. When the epigastric hernia is not associated with ulcer of the stomach or duodenum, a striking increase in the tonicity of the stomach is noted in a large number of cases and signs of atony are rare. The signs of increased tonicity are retarded unfolding of the stomach on filling, a dome-like, tense gastric bubble, obliquity of the main axis of the stomach, and elevation of the greater curvature. There is undoubtedly a pathologic relationship between increased tonicity and epigastric hernia. Very often peristalsis is markedly increased, probably as a reflex. The period of expulsion is then shortened and on further examination the emptying is found delayed. The repeated observation of spastic conditions and the other symptoms point to an excitation neurosis due to the epigastric hernia.

The conclusion is drawn that the methods of examination fail in the obscure and doubtful cases, exploratory laparotomy being necessary for the diagnosis. It seems very probable that there is a genetic relationship between the ulcerative processes in the stomach and duodenum and epigastric hernia. It must be assumed that spastic conditions are produced in the gastric wall, and these, as suggested by Bergmann, cause ulcer formation as a reflex through the stimulation exerted by the hernial contents. It is very difficult to prove that the epigastric hernia was present before the first epigastric symptoms. The reflex does not necessarily originate in an adherent tip of peritoneum, as true peritoneal herniæ are rare. Tension on the peritoneal ring due to increased intra-abdominal pressure may be sufficient. The relationship between epigastric hernia and the excitation-neurotic syndrome, noted in 50 per cent of the cases, cannot be merely accidental.

The author has previously described very similar phenomena in the stomach and duodenum occurring in gall-stone colic. SCHWARZ (Z).

Braizeff, W.: Pylorectomy for High Ulcer of the Lesser Curvature (Pylorektomie bei hochliegendem Ulcus der kleinen Kurvatur). *Wratschebnoje Djelo*, 1921, iii, 245.

In the case of an ulcer lying high in the stomach transverse resection, although it has its disadvantages, is considered the operation of choice. The mortality following it is greater than that following gastro-enterostomy; it is sometimes apt to cause an hour glass stomach, recurrence cannot be absolutely prevented; and finally, it is a severe operation which cannot be considered in every case. As pylorospasm is a constant complication of high ulcer, and as this prevents its healing, the author performed a pylorectomy in a case of this type in which a resection could not be carried out on account of the patient's condition. This was a case of callous ulcer of the lesser curvature at the junction of the cardiac and middle thirds. Upon examination one and a half months after operation, the patient was free from symptoms.

Whether pylorectomy can be performed in all such cases is for the future to demonstrate, but the operation has many advantages over gastro-enterostomy and resection in that many of the well-recognized complications which may follow gastro-enterostomy are absent, it is a relatively simple procedure, and the resulting condition permits the stomach to empty itself readily. Von Holst (Z).

Roepke, W.: How Should an Ulcer of the Stomach and Duodenum Which Has Perforated into the Abdominal Cavity Be Operated on and Treated? (Wie soll das frei in die Bauchhoehle durchgebrochene Geschwuer des Magens und Zwoelffingerdarms operiert und behandelt werden?) *Deutsche med. Wchnschr.*, 1922, xlviii, 899.

The author reports his experiences in nineteen cases of ulcer of the stomach and duodenum which perforated into the abdominal cavity.

It is now generally recognized that the treatment of such cases is surgical. The fact that in certain cases the liver or the omentum will restrict the accumulation of gastric contents to the upper abdominal space and thus prevent diffuse peritonitis for some time or permanently cannot be used as an argument against operative treatment.

The operation should be undertaken as soon as possible. As a rule it will bring relief as suppurative peritonitis generally does not develop until after twenty-four hours.

In the thirteen cases in which operation was done within the first forty-eight hours there were no deaths, while in the six cases in which it was performed after forty-eight hours the mortality was 50 per cent. Complications, such as pelvic and subphrenic suppurations, appear within eight hours of the operation in 20 per cent of the cases, within forty-eight hours in 37.5 per cent, and after forty-eight hours in 66.6 per cent.

Roepke opens the abdomen by a median incision above the umbilicus. This should be made no longer than absolutely necessary as every additional enlargement means greater cooling of the peritoneum and increases the danger of visceral prolapse which may require forceful reposition and lowers the resistance of the peritoneum.

In regard to the treatment of the perforated ulcer itself Roepke declares himself a decided opponent of any procedure including resection of the diseased portion of the stomach. As a rule, he merely sutures over the perforation. He warns against excising the callous parts of the border to obtain normal movable gastric wall for the suture because this procedure may cause a large defect the closure of which prolongs the operation. To re-inforce the suture or the approximated wound edges a tip of the omentum or the hepatic ligament or a free transplant may be sutured to it. Ulcers treated in this manner tend to heal quickly, especially when a gastro-enterostomy is done in addition. A strip of gauze gives sufficient drainage of wound secretions.

The infected abdominal cavity should be treated by the simplest and most rapid procedure possible. Roepke does not approve of irrigation, preferring mere sponging out of the foreign material. The peritoneum will take care of the inaccessible portions, either resorbing or encapsulating them. The mortality in cases treated by irrigation (183 reported in the literature) was 39.8 per cent while in Roepke's cases it was 15.7 per cent.

Gastro-enterostomy is performed in the presence of a stenosis or when its development is feared, as for instance when the site of the ulcer is near or at the pylorus or in the duodenum, where constriction may be caused by healing as well as the use of a suture. The gastro-enterostomy relieves the site of operation in every case, particularly when only a simple suture has been applied; furthermore, it is the best method to favor healing of ulcers and allows the patient to take sufficient nourishment very early.

Roepke performs a posterior gastro-enterostomy in all cases in which the operation is done within forty-eight hours and which appear suitable; in later cases he applies it only when a distal stenosis is present or threatening. He does not use it when suppurative peritonitis is present.

Posterior gastro-enterostomy was done in thirteen of the nineteen cases reported. The one death occurred in a case in which cleansing of the gastro-intestinal tract was done only after an interval of seventy-two hours and there was severe stenosis. Of the six patients not treated by gastro-enterostomy two died after an interval of ninety-five and ninety-six hours respectively.

Subsequent examinations showed that eleven of the patients treated by gastro-enterostomy were entirely free from symptoms, whereas of the six not so treated, one required a second operation for ulcer.

The after-treatment should consist of rest, dietetic treatment, and the application of heat to the abdomen to obtain abdominal hyperæmia and promote intestinal peristalsis. Bode (Z).

Schmidt, E. R.: Forty-Four Cases of Simple Perforation of Gastric and Duodenal Ulcers with a Single Method of Surgical Treatment. *Acta chirurg. Scand.*, 1922, lv, 314.

The author states that the average mortality of simple perforating ulcers of the stomach and duodenum is between 10 and 40 per cent. He reports forty-four cases operated upon during the years 1908–1921 by seven different surgeons using the same method. In no case was operation refused on account of the patient's poor general condition. The lesion develops most frequently between the twenty-first and fortieth years of age. In the author's series there were two patients under 21 years and fourteen over 40 years. Thirty-two of the patients were males. One duodenal ulcer was found in a female patient and nine occurred in male patients. Five of the forty-four patients gave no ulcer history. The remainder had had ulcer symptoms for periods ranging from a few weeks to over twenty-three years.

The mortality was 13.33 per cent in the cases operated upon twelve hours or less after perforation, and 57.1 per cent in those operated upon between twelve and thirty hours after perforation. While the time elapsing between the perforation and operation is very important with regard to the prognosis, the location of the ulcer and the patient's condition are also of great significance. The mortality increases directly with the distance of the perforation from the pylorus. If the ulcer is so situated that localization may occur, the prognosis is better. Ulcers of long duration are more favorable for localizing because of neighboring adhesions. If the perforation occurs when the stomach is empty, localization is more apt to occur than if the stomach were full.

There were no deaths in the ten cases of duodenal perforation. The perforation was closed by excising the ulcer and then suturing. When excision was impossible, the ulcer was infolded. A gastrostomy was then performed and the abdomen irrigated with normal saline solution at 40 degrees C. A drain was used in only five of the cases. When the patient was returned to his bed he was given proctoclysis, hypodermatoclysis, and sufficient morphine to relieve pain. As soon as he regained consciousness he was allowed to have vichy water or vichy and milk. The amount of fluid taken by mouth and the amount that ran out of the gastrostomy tube were recorded. A few days after the operation the gastrostomy tube was closed. If there was no nausea or vomiting by the end of a week, the tube was removed. An ulcer diet was given for some time after the operation. The average length of time the patients remained in the hospital was 33.39 days.

Of the forty-four patients operated upon, eleven died. The ulcer was excised in thirty-nine cases and sutured in four. In one, a Witzel fistula was made. A Mikulicz plastic was performed in one case, and a gastrogastrostomy for hour-glass constriction of the stomach in one. In a later study of these cases it was found that eleven of the twenty-four patients had had no further symptoms, three had mild symptoms, six had a recurrence and had undergone medical treatment, two had had a recurrence necessitating operation, and two were dead.

The author draws the following conclusions:

1. Perforation may occur at any age, but necessarily occurs more often during the ulcer-bearing period.

2. The mortality depends for the most part on three factors: the time elapsing between the perforation and operation, the severity of the peritonitis, and the patient's general condition at the time of perforation. The mortality rates of the different series of cases reported will vary as these factors vary in the cases comprising the series.

3. Gastro-enterostomy is a superfluous procedure in the treatment of perforated ulcer. By employing gastrostomy instead the mortality rate can be reduced from 2 to 6.5 per cent.

4. The gastrostomy opening serves as a safety valve. Nourishment can be given through it even before the patient awakens from the narcosis. All the postoperative discomfort of eructation, hiccough, nausea, and vomiting is eliminated. If lavage is necessary, it is a simple procedure and not disagreeable to the patient.

5. Primary suture of the abdomen after thorough irrigation with normal salt solution at 40 degrees C. favors a smooth postoperative recovery.

6. Of twenty-two patients re-examined, only two have required a second operation for recurrence of the ulcer.

7. When they leave the hospital, patients should be impressed with the fact that an ulcer diet is very essential for continued freedom from recurrence of ulcer and that it is highly desirable for them to remain under medical control for some time.

8. No cases of cancer of the stomach developed in the series of cases reviewed.

9. A high median incision has proved most satisfactory.

10. Excision of the ulcer removes pathologic tissue, allows approximation of the edges so that there is no protruding ulcerated surface on the inside, reduces the tension of the sutures, affords a better hold for the sutures, and leaves less scar tissue after healing.

11. Persons with ulcer should be warned of the possibility of recurrence of the ulcer and perforation.

J. A. H. Magoun, M.D.

Cutler, E. C., and Smith, J. A.: Lymphoblastoma of the Stomach; Report of Two Cases. *Surg. Clin. N. Am.*, 1922, ii, 1105.

The authors prefer the term "lymphoblastoma" of the stomach to "lymphosarcoma" and assert that the indiscriminate use of the term "sarcoma" has been the cause of much confusion. The disease is relatively rare. At the Mayo Clinic there were twelve cases during the period from 1913 to 1920, a proportion of one lymphosarcoma to sixty-eight gastric carcinomata. The lymphatic type is the

most common form of gastric sarcoma. Of Haggard's seventy-six cases of gastric sarcoma, thirty represented a tumor of lymph-cell origin. Six of the twelve cases at the Mayo Clinic were operable; two of the patients died from sepsis following operation, one died four months later with general recurrence, and two showed metastases five to seven months after the operation. Seven of the twelve cases were diagnosed before operation as carcinoma; one as ulcer; one as an abdominal tumor, probably inflammatory; one as gastric lesion, probably malignant; one as pyloric stenosis; and one as a tumor in the upper abdomen, probably of the pancreas.

The differential diagnosis from cancer is practically impossible. The signs, symptoms, and gastric analysis are nearly the same. Hæmorrhage and anæmia are not so common as in cancer because the mucous membrane more frequently remains intact. The tumor tends to project into the lumen without ulceration and its consequent X-ray filling defect. The history is shorter and the course more rapid than in cancer.

The authors report two cases of lymphoblastoma diagnosed as cancer.

Case 1. The patient was a man 59 years of age, who, seven months previous to admission to the hospital, experienced a progressive loss of appetite until, during the last two months, almost no nourishment had been taken. Nausea and a slight cramp-like epigastric pain followed the ingestion of food and changing of the position in bed at night. The pain did not radiate. The patient became restless and lost sleep. His weight dropped from 135 to 120 lbs.

The patient was a poorly nourished man with carious teeth, pyorrhœa, and a foul breath. The abdomen was soft and symmetrical. A firm, slightly tender mass the size of an orange, which seemed to move with respiration, could be felt high in the left epigastrium. The hæmoglobin was 75 per cent. There was absence of free hydrochloric acid, and the total gastric acidity was low. X-ray examination revealed a filling defect high up on the lesser curvature in the cardiac region of the stomach, which appeared displaced forward and to the left. The fixation and irregularity of the stomach suggested malignancy. At operation, the peritoneal cavity was found to contain a moderate amount of slightly turbid fluid. The stomach was distended with gas. A large mass just beneath the diaphragm overlay the aorta, pushed the cardiac end of the stomach toward the left, and infiltrated the lesser curvature. The regional lymph glands were enlarged. The condition was diagnosed as inoperable cancer. After the operation the patient had persistent hiccough and an irregular pulse. Death occurred eight hours after the operation. The pathologic diagnosis was gastric lymphosarcoma with metastases to the regional and retroperitoneal lymph glands and fat. The peritoneal fluid contained staphylococci and leucocytes.

Case 2. This case was that of a man, aged 57 years, who gave a history of dull epigastric pain coming on about one-half hour after meals for ten months. This pain gradually became more severe until, during the last five weeks, it had been a "continuous agony." The ingestion of meat aggravated the condition. The patient had lost 38 lbs., and was poorly nourished. Slight epigastric tenderness was found, but no palpable mass. The hæmoglobin was 65 per cent and the red blood cells numbered 3,740,000. There was absence of free hydrochloric acid. The total gastric acidity was low. X-ray examination showed a definite annular constriction in the antrum. At operation the stomach appeared normal, but palpation revealed, 2½ in. from the pylorus, a hard irregular mass which constricted the lumen until it scarcely admitted a finger tip. The regional lymph glands were enlarged. The gastric tumor, pylorus, and 1 in. of the duodenum were resected and a posterior gastro-enterostomy was done. Convalescence was complicated by bronchopneumonia. Twelve months after the operation the patient had no gastric complaint, felt well, had worked for six months, weighed 133 lbs., and showed no abdominal masses or tenderness. The pathologic diagnosis was gastric lymphosarcoma.

WALTER C. BURKET, M.D

Starr, F. N. G.: Cancer of the Stomach. *Canadian M. Ass. J.*, 1923, xiii, 24.

The author emphasizes the fact that pain is often a late symptom in cancer of the stomach. An examination for this condition should be made when a patient complains of discomfort in the epigastrium occurring at irregular intervals without relation to food intake and associated with loss of energy. This investigation should include a complete history, a physical examination, an X-ray examination, and all laboratory tests.

In the five years from 1907 to 1911 inclusive the author operated on eight cases of cancer of the stomach. In only four was it possible to perform a gastro-enterostomy. No radical operations were done.

From 1912 to 1916 inclusive twenty-nine cases were operated upon. In thirteen (45 per cent) a palliative gastro-enterostomy was possible. In five (17 per cent), resection of the stomach was done. One of the patients treated by gastrectomy died of pneumonia three years later, two are still living, and two cannot be traced.

From 1917 to 1921 inclusive thirty-nine cases of gastric cancer were treated. In twelve, a palliative gastro-enterostomy was done, and in thirteen (33 per cent) a radical operation. Of the patients subjected to a radical operation four died (one of delayed shock two days later, one of acute dilatation ten days later, one of pneumonia eleven days later, and one of secondaries in the liver two years later), one is now dying of secondaries in the retroperitoneal glands, and eight are living and well.

The author advocates exploring late cases under local anæsthesia after pre-operative treatment con-

sisting of the administration of 5 per cent sodium bicarbonate solution with 10 per cent glucose by Murphy drip and gastric lavage the night before and the morning of the operation. During the operation hypodermoclysis of normal saline should be given into the axilla. The extent of the operation will depend on the condition found.

J. A. H. MACCUEN, M.D.

Dahl-Iversen, E.: Ulcerated Carcinoma and Carcinomatous Ulcer Simulating Round Ulcer (Ulcéro-cancer et cancer ulcéré simulant l'ulcère ronde). *Acta med. Scand.*, 1922, lvii, 134.

Two cases are reported which clinically were similar to cases of gastric ulcer. At operation one case presented the picture of a typical gastric ulcer situated upon the lesser curvature and microscopically showed carcinomatous change. In the other case a hard infiltrated carcinoma with an ulcerated surface was found.

LOYAL E. DAVIS, M.D.

Walker, I. J.: Postoperative Obstruction of the Small Intestine. *Surg. Clin. N. Am.*, 1922, ii, 1145.

Because of its present high mortality of about 30 per cent, intestinal obstruction is as much dreaded as any post-laparotomy complication. The treatment of acute ileus has not progressed as has the treatment of other acute abdominal conditions.

The high mortality of obstruction of the small intestine is due chiefly to the non-recognition of the seriousness of symptoms by the laity until the condition is hopeless, or the insidious onset of the condition following operation while the patient is still under the eyes of the surgeon.

The author divides acute postoperative obstruction into two types: that occurring within a few days or weeks after operation, and that coming on months or years after a laparotomy. The former occurs usually in patients with considerable infection, trauma, or drainage, and appears about the fifth day after operation. The latter is due to the exudate produced after operation.

Adhesions are located where trauma and infection have been greatest. This is usually in the ileum. Death is caused by the absorption of toxins.

The author is unable to describe a constantly typical syndrome, or to differentiate other obscure abdominal conditions. In the differential diagnosis he relies upon the history, especially as regards causative factors in the production of adhesions, and the development of the symptoms. In a case cited as a typical case of acute postoperative obstruction the diagnosis rested on the salient features of: (1) vomiting, without known cause, first of stomach contents, later of bile-stained fluid, and later of yellow contents of the upper intestinal tract, which was uncontrolled by the restriction of fluids by mouth and gastric lavage; and (2) a decrease in the amount of flatus following repeated enemata. Palpation of the abdomen is usually negative except in the presence of beginning peritonitis. The pulse gradually increases in rapidity, and in the late cases becomes weak and irregular. The mortality varies from 3 to 100 per cent, depending upon the duration of the obstruction. Recovery resulted in 90 per cent of the cases operated upon within the first eight hours.

Treatment should be directed first toward the relief of the toxic condition with the least amount of shock. Walker recommends jejunostomy under local anæsthesia, followed at a later date by operation for the relief of adhesions.

In the technique used by the author the incision is made in the midline or the upper left quadrant. The jejunum is located by the ligament of Treitz and the uppermost loop is grasped with the forceps. Two pursestring sutures are thrown around the forceps, an opening is made into the gut large enough to pass a No. 16 or 18 French self-retaining catheter, and the pursestrings are tied. The catheter is then passed through a portion of the omentum which will drop down and seal the gut when the catheter is removed; this is done by cutting off the bulbous end and allowing it to drop into the gut. The fistula usually heals within three weeks. In only one case of a series of twenty-eight was operative closure necessary.

The operation for the relief of the obstruction is undertaken after the toxic symptoms have subsided, as a rule within five days. When obstruction is caused by acute inflammation, relief is usually obtained without further operative interference. In a series of sixteen cases in which jejunostomy was done for the relief of obstruction occurring within five to fourteen days after operation, recovery took place without further operative procedures. Jejunostomy is advocated as a method which will lower the present high mortality rate of acute intestinal obstruction. WILLIAM E. SHACKLETON, M.D.

Quain, E. P.: Chronic Duodenal Obstruction—Etiology, Symptoms, and Treatment. *N. York M. J. & Med. Rec.*, 1922, cxvi, 651.

Chronic duodenal obstruction causes symptoms varying from mild epigastric distress to severe headache, vomiting, and vertigo. The condition is often confused with gastric ulcer, gall-bladder disease, and appendicitis.

The most common symptoms are chronic epigastric distress which varies in time and duration, but is usually worse two or three hours after eating; nausea; the vomiting of often large quantities of vomitus containing bile; constipation; periodical vertigo; and headache. The symptoms disappear after copious bile emesis. The attacks are separated by periods of normal digestion. The patient may be confined to bed more often by the severe headache than by the nausea

This obstruction of the duodenum may be due to several different causes, but the upright position is responsible indirectly. A short mesentery will prevent the downward gravitation of the intestines.

The blood vessels are the chief support of the mesentery, which, if short, must bear the entire weight of the intestines, this being the cause of the serious pathologic results.

The duodenojejunal juncture between the aorta and the superior mesenteric artery may cause a constriction if the mesentery is short. An excess of fibrous tissue at this juncture causes further constriction.

A second cause of constriction is a mobile ascending colon with a mesentery largely supported by the colica media artery, which presses upon the third portion of the duodenum, causing obstruction and dilatation.

A short fetal mesentery will prevent the ascending colon and hepatic flexure from reaching their normal locations and thus cause coloptosis on the right side. In such cases both of the preceding factors may constrict the duodenum.

Since these conditions are congenital, the symptoms usually date from early childhood.

A positive diagnosis can be made with the X-ray by turning the patient sideways. Bulging or displacement of the duodenum may be associated with a barium residue or delayed emptying.

In mild cases a recumbent position after meals, or elevation of the lower abdomen in the knee-chest or the Trendelenburg position will often allow the duodenal muscles to regain their tone.

In more advanced cases non-operative treatment includes rest in bed for a few weeks, the Trendelenburg position for several hours each day, and the application of a pad over the lower abdomen.

If surgery is advisable all the upper abdominal organs should be thoroughly examined at the time of the operation. Ptosis of the right colon will usually be relieved by fixation. If dilatation extends to the jejunal juncture, duodenojejunostomy is the best treatment. Care must be taken not to injure the blood vessels or lymph glands. A description of the operation follows.

The author has been able to cure or relieve nearly 50 per cent of these cases.

MARCUS H. HOBART, M.D.

Macrae, D., Jr.: Chronic Duodenal and Gastric Ulcer Diagnosis. *J.-Lancet*, 1923, xliii, 26.

The technique of operation for chronic duodenal and gastric ulcer is a matter of choice and should be decided upon after the abdomen is opened. Moynihan has said that of every ten cases of unsatisfactory results after gastro-enterostomy nine are due to the fact that the operation was performed in the absence of any organic lesion to justify it.

The two conditions should not be discussed as one subject since the pathology, symptoms, and treatment are distinct. The "pyloric white line" and "pyloric vein" may be taken as the anatomical line of demarkation.

Gastric ulcer is a rare disease as compared with duodenal ulcer (1:12). Persons with gastric ulcer are usually emaciated, weak, and pale. The ulcer varies greatly in appearance and sensation. In some cases it perforates the liver and pancreas. It is subject to cancerous degeneration, causes severe pain soon after eating, and calls for gastro-enterostomy combined with excision, cauterization, or gastrectomy.

Duodenal ulcer, on the other hand, is a common lesion and in many cases causes only mild symptoms. It varies little in size and appearance, and its symptoms commonly resemble those of other abdominal affections. Its pain is delayed. The treatment of choice is gastro-enterostomy without excision.

In cases of gastric ulcer the pain is typically regular shortly after the ingestion of food. In cases of duodenal ulcer there is a feeling of fullness and discomfort. Tenderness is not usually characteristic but a deep pain in the epigastrium boring through to the back suggests a lesion on the posterior surface. The sequence, "food—comfort—pain—food—comfort—pain," is of the greatest importance in the diagnosis of gastric ulcer.

Vomiting is not an important diagnostic symptom except in marked stenosis, and is given too much prominence in the textbooks.

Hæmorrhage is also given too much prominence in the literature. Blood is found in the stool or vomitus in less than 20 per cent of the cases of gastric ulcer. On the other hand, it is one of the first and most important signs of cirrhosis of the liver and has been the cause of many operations for supposed gastric ulcer.

When the history has been taken carefully, little can be gained by a physical examination. The examination of the stomach contents should be discarded. Exploratory operation with examination of the ulcer is, of course, the only sure means of detecting the condition. The X-ray is of great value, but should not be given too much importance.

The cause of ulcer is usually infection from other parts. Ninety per cent of cases of so-called "dyspepsia" or other "stomach troubles" diagnosed as ulcer without the X-ray or surgery are not cases of ulcer. The two chief offenders are the appendix and gall-bladder.

The pyloric valve has been mistaken by some inexperienced operators for ulcer. The "white line" was so diagnosed in a case in which autopsy proved the absence of ulcer.

The author states that an operation for ulcer should never be performed unless the ulcer can be seen and felt. All chronic ulcers should be removed if possible. MARCUS H. HOBART, M.D.

Bettman, R. B., and Blum, D. M.: Acute Intestinal Obstruction Caused by Fæcal Impaction in Meckel's Diverticulum. *J. Am. M. Ass.*, 1923, lxxx, 230.

The case reported, that of a boy 10 years of age, is of interest because of the rarity of the pathologic condition. Eight inches above the ileocæcal valve a Meckel diverticulum protruded from the ante-

mesenteric border of the intestine. Gentle pressure on the diverticulum caused the intestional contents to slip into the collapsed ileum followed by gas and fluid causing a gurgling sound. The contents could be milked along the ileum into the large intestine. No attempt was made to obliterate the diverticulum. Recovery was uneventful. Later the diverticulum could not be seen by the X-rays.

E. C. Rohrsheb, M.D.

McFarlan, P. F.: Intestinal Obstruction Following Acute Appendicitis and Peritonitis. *Brit. M. J.*, 1923, i, 61.

The case reported was that of a 20-year-old man who was operated upon for acute appendicitis thirty hours after the acute onset of fever, generalized tenderness over the entire lower abdomen, and marked rigidity. There was no history of previous attacks. At operation a gangrenous appendix was removed and found to contain two concretions. The pouch of Douglas contained a considerable quantity of pus, and there was marked injection of all the peritoneal surfaces which came into view. A corrugated rubber drain was introduced into the pouch of Douglas.

The postoperative management included the administration of glucose and saline solution per rectum and ½ gr. of morphine on the first night. The temperature was normal the following morning and never rose above 100 degrees F. The pulse was normal on the fifth day. From the second night the patient complained of intermittent pain and a desire to move his bowels. He also showed slight distention. On the evening of the third day he was given a small turpentine enema, and on the fourth day castor oil and another turpentine enema. The bowels moved slightly that night and three times the next day, aided by ½ gr. of calomel hourly up to 2 gr. and another enema. The distention increased constantly however and the discomfort continued. There was no vomiting. On the seventh and eighth days there were several small liquid movements. The distention had increased to such an extent that it stretched and opened the incision.

On the ninth day the abdomen was opened. The small intestine was found distended above a dense adhesion which bound it firmly to the mesentery of the pelvic colon. Following this operation there was distention of the stomach but this was reduced rapidly by gastric lavage. Thirty hours after the operation the patient was given pituitrin, and enemata, and castor oil by the stomach tube. The next day he had a copious liquid evacuation, and for a day or two he was relieved but then became much worse. Fifteen days after the first operation the ileum was opened and a tube placed therein. This relieved the distention, and the bowels moved freely two days later.

Slow recovery followed. By the end of the sixth week the patient left the hospital with the wounds healed but with a hernia at the site of the appendix incision.

H. W. Fink, M.D.

Oudard: A Case of Cystic Appendicitis. (Un cas d'appendicite kystique). *Bull. et mém. Soc. de chir. de Par.*, 1922, lxviii, 1199.

Cases of cystic appendicitis are rare. The author reports one case of his own.

The lesions are of two principal types. Those of the first type, which may be called "mucoceles," are due essentially to hypertrophy of the lymphoid tissue of the appendix, the elements of which are distended by mucus. Those of the second type include diverticular cysts. Under the influence of inflammation and repair, secondary cavities with débris of the mucosa of the primary cavity are formed. In the majority of cases there is a communication between the cavities of the cyst and the appendix. The diverticular cysts seem to be due to small parietal abscesses opening into the lumen of the appendix which heal after suppuration, the regenerated epithelium of the internal surface of the appendix then extending into the adjacent sac by karyokinesis.

The author's case was different from either of these usual types (mucocele and diverticulum). Histologic examination showed a stenotic appendicitis of the hyperæmic type with chronic sclerotic lesions and traces of old extinct inflammation. In addition to these signs of ordinary appendicitis, a solitary cicatrized diverticulum at the base and several subserous cystic formations were found. The diverticular cyst was in the vicinity of the base.

Whatever may have been the pathogenesis of this outlying diverticular cyst, the appendicular cystic formations (of which there were four) were completely independent of the cicatricial diverticulum, lacked epithelium, and because of their evidently vascular origin and blood content, constituted a distinct type of lesion.

W. A. Brennan.

Phifer, C. H.: Hæmorrhage Following Abdominal Operations; with Special Reference to Appendicectomy and Excluding Bleeding from the Stump. *Surg., Gynec. & Obst.*, 1923, xxxvi, 80.

Luksch found that enterorrhagia occurred once in every hundred operations for strangulated hernia. Postoperative hæmatemesis after abdominal operations is rare. It may follow operations on the peritoneum, omentum, intestine, gall-bladder, kidney, uterus, and ovaries, usually from the second to the tenth day. The author reports the case of a young girl subjected to appendectomy for subacute appendicitis who developed symptoms of hæmorrhage and passed blood by the bowels on the second day after the operation. A second laparotomy was then done. The appendix stump was found to be in good condition. The bleeding ceased on the fifth day following the usual treatment for hæmorrhage. In the author's opinion the hæmorrhage in this case was due to thrombosis with embolism of the walls of the intestine followed by ulceration.

Phifer collected from the literature forty-three cases of postoperative hæmorrhage following abdominal operations. There were twenty-one recoveries and twenty-one deaths. In one case report the

result is not stated. In five cases, in which there was one death, the bleeding was from the bowel, in seven, in which there were two deaths, it occurred from the wound; and in twenty-six cases, in which there were seventeen deaths, it occurred from the stomach. In three case reports the nature of the hæmorrhage is not stated. In four instances ulcers were found in the stomach or duodenum.

Direct hæmorrhage following appendectomy may occur from the superficial abdominal vessels, the meso-appendix, the bowel, the abscess cavity, the deep epigastric and external iliac arteries, or the appendix stump.

Moynihan states that postoperative hæmatemesis is to be looked for especially after operations on the stomach, duodenum, and bile passages. As responsible factors he mentions: (1) the anæsthetic; (2) injury to the stomach or bowel resulting in ulceration; (3) injury to the omentum causing thrombosis of the omentum followed by embolism in the walls of the stomach or bowel (von Eiselsberg); (4) sepsis (Rodman); and (5) reflex influence (Mayo-Robson).

The author regards trauma and embolism alone or combined as the cause of this condition.

J. A. H. Magoun, M.D.

Oudard and Jean: Inguinal Hernia on the Right Side Following Appendectomy (Hernies inguinales droites après appendicectomie). *J. de chir.*, 1922, xx, 584.

The authors report nine cases of inguinal hernia on the right side which occurred in adult males following appendectomy. The average time between the operation and the development of the hernia was thirteen months. The content of the hernial sac was chronically inflamed omentum. The sac was very thin and the omentum firmly attached by dense adhesions. The abdominal wall was thinned and weakened and the external abdominal ring enlarged. An impulse upon coughing was noted.

The adhesions of the omentum to the peritoneal wall no doubt occurred at the time of the attack of appendicitis or immediately after the operation and constituted probably the primary pathogenic factor in the development of the hernia. Direct injury of the muscles or the nerve supply of the muscles of the anterior abdominal wall caused the necessary weakening of resistance.

Clinically, these herniæ resemble the ordinary inguinal herniæ, but the sac differs materially from that found in cases of congenital failure of the processus vaginalis to close completely. As a rule a herniolaparotomy is necessary. Loyal E. Davis, M.D.

Bonnet: Residual Appendicular Abscesses Opening into the Bladder by the Subperitoneal Route After the Removal of the Appendix (De l'ouverture dans la vessie par voie souspéritoneale des abcès appendiculaires résiduels, après ablation de l'appendice). *Lyon chir.*, 1922, xix, 561.

Bonnet's patient, a man 40 years of age, was operated upon for gangrenous appendicitis. Three weeks after the removal of the appendix a subperitoneal perirectal abscess developed to the left of the rectum and drained into the bladder.

Subperitoneal pelvic phegmons in appendicitis are rare. Abscesses in the space of Retzius are more common; these also may open into the bladder.

In the case reported the gangrenous appendicitis caused peritonitis. A drain was placed in the Douglas sac and brought out at the lower end of the wound. During the days following, gangrene of the aponeurosis developed and some of the infecting fluid from the peritoneum infiltrated the musculature. It is possible that the peritonitic fluid may have filtered into the lower pelvis between the peritoneum and the muscle planes. Bonnet therefore recommends the use of a peritoneal drain and suturing of the lips of the peritoneum to the aponeurotic planes to prevent infiltration of the subperitoneal cellular tissue. W. A. Brennan.

Trueblood, D. V.: End-to-End Intestinal Anastomosis: An Experimental Study. *Northwest Med.*, 1923, xxii, 27.

The operation described, which is still in its experimental stage, is applicable to the large and small bowels for end-to-end or end-to-side anastomosis. The diseased bowel is resected by means of small clamps and a cautery. The two ends are approximated and the cauterized edges turned up so that a continuous Cushing mattress suture can be introduced as close to the clamps as possible. This loose continuous suture is then pulled taut to approximate the serous surfaces of the posterior line of the anastomosis and then locked by taking an extra bite through the two approximated edges.

When an intestine is crushed with the crushing clamp the mucosa and smooth muscle tissue squeeze out from under the clamp, leaving the serosa and submucosa of the two walls pressed together into a fibrous ribbon. When the clamps are removed these two ribbons stand up stiffly side by side. Both ends of the ribbons are caught in small hæmostats and the ribbons held taut while one or more basting stitches are introduced.

The continuous Cushing mattress suture is continued around the bowel and the two ends are tied. The basting threads are then withdrawn. For reenforcement, especially at the mesenteric edge, Halsted's mattress sutures are introduced and continued all the way round where necessary. The rent in the mesentery is then closed. By grasping on each side of the anastomosis with the thumb and forefinger, the approximated lips are separated and the size of the stoma may be determined. The tissue held in the two small hæmostats is cauterized away from the crushing clamp. The ribbon held within this clamp is united to that opposite.

The following conclusions are drawn:

1. The procedure described is a simple, aseptic method of anastomic suture in which the openings are closed by basting threads which, after the anastomosis has been completed, are withdrawn.

2. It is applicable to the large and small intestines for almost any type of union in any location.

GEORGE E. BEILBY, M.D.

Symonds, C.: Gonorrhœal Stricture of the Rectum. *Proc. Roy. Soc. Med.*, Lond., 1923, xvi, Sect. Surg., 13.

The type of stricture to which Symonds refers involves the lower 3 or 4 in. of the rectum, including the anal margin and the entire circumference of the bowel. The bowel shows bands and bridles of indurated muscle separated by pockets, from the bottom of which fistulous tracts lead into the vagina or to the surface around the anus. Extreme narrowing occurs at several points and in advanced cases will not permit digital examination. Hard polypoid growths are found surrounding the anal margin. The patient states that a discharge from the rectum has persisted for many years.

The author reports seven cases, all those of women. In two cases colostomy was followed by symptoms of toxic absorption and death. In one case, following a digital examination, there was profuse diarrhœa with blood and pus followed by collapse and death. In another case death occurred after the removal of the polypoid masses. In two cases the removal of the cicatricial areas was undertaken some time after colostomy. In one, the results were successful, but in the other, it was impossible to reach healthy bowel. One case was relieved by colostomy.

The author was able to find specimens of thirty-eight other cases in museums. Many of these museum specimens were labeled "syphilitic origin."



Fig. 1. Gonorrhœal stricture of rectum in female.



Fig. 2. Gonorrhœal stricture of rectum in male.

In the treatment of this condition various procedures may be employed to meet certain indications. The use of bougies and division of the stricture is limited because of the danger of perforation. Excision can be done only when the limits of the disease can be reached with the examining finger. Colostomy occupies a prominent place in the treatment. Cæcostomy and appendicostomy may be valuable in selected cases. I. E. BISHKOW, M.D.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Jones, J. F. X.: The Removal of a Retention Cyst from the Liver. *Ann. Surg.*, 1923, lxxvii, 68.

Non-parasitic liver cysts may be classified as:

1. Teratomatous or embryomatous cysts.
2. Pseudocysts, including cystic degeneration of carcinoma and sarcoma, softening of cirrhotic nodes, and cysts due to hæmorrhage.
3. Lymphatic cysts, which contain clear, watery, yellowish fluid with albumin, a large percentage of sodium chloride, and no bile, are usually small, and are lined with endothelium.
4. Cystic degeneration of the liver associated with cystic kidneys, and also occasionally with cysts in the spleen, pancreas, or ovary. The cysts vary from a microscopic to a macroscopic size and are lined with epithelium ranging from a low to a columnar type. The dilated tubule is surrounded by fibrous tissue. The fluid is clear, albuminous, and free from bile, and may show cholesterin, leucin, blood, and creatinin.
5. Cysts which arise from blood vessels.

6. Single or multiple cystadenomata, which are lined with epithelium and contain a clear or turbid albuminous, variously colored fluid.

7. Simple ciliated epithelial cysts, which are no larger than a walnut, free from bile, and located on the anterior surface of the liver near the suspensory ligament and along the inferior border.

8. Retention cysts, which are due to the engorgement of a bile duct and contain serous or mucous fluid or bile.

A non-parasitic cyst is usually lined with epithelium or endothelium.

A parasitic cyst may be ruled out by microscopic examination of the fluid and cyst wall. The fluid of a cyst containing a living hydatid is colorless; it contains succinic acid, and sugar, but no albumin. In some cases there may be hooklets, scolices, or daughter cysts. When the hydatid is dead the fluid becomes turbid, albuminous, and toxic. A hydatid cyst shows an outer capsule, the ectocyst, and an inner membrane, the endocyst, which, with its daughter cyst, may be readily shelled out. The value of a hydatid thrill in the differential diagnosis is very questionable. The various laboratory tests for hydatid disease—miostagmin, Abderhalden, and intradermic reactions, the complement-fixation, and cutaneous tests may be positive.

The diagnosis of a non-parasitic liver cyst is seldom made before operation or autopsy. Such cysts are mistaken for hydatid or ovarian cysts, hydronephrosis, mesenteric cysts, parasitic cysts, tuberculous peritonitis, distended gall-bladder, sessile tumor of the liver, etc. Occasionally the X-ray may show a relation of the cyst to the liver shadow or rule out the thoracic condition. It is important to differentiate the extrahepatic bile-duct cysts, such as a diverticulum or idiopathic dilatation of the common bile duct, which should be treated by a primary choledocho-enterostomy.

Complications, such as rupture, hæmorrhage, and suppuration, have been rare.

The treatment for both parasitic and non-parasitic cysts is similar. After the interior of the cyst has been disinfected and the cyst lining destroyed by chemical means, and, in cases of hydatid disease, the endocyst has been removed, the sac is stitched to the abdominal wall (marsupialization). The cyst may be drained or the abdominal wound closed without drainage. Occasionally an encapsulated cyst may be completely excised. In non-encapsulated cysts, because of the difficulty of approach and hæmorrhage, a very thin capsule excision of the sac is inadvisable. A pedicled cyst may be completely removed. If a non-parasitic cyst cannot be extirpated or marsupialized, the cyst wall may be anastomosed to the duodenum.

The author gives a brief report of sixty-one cases of non-parasitic liver cysts operated upon surgically which have been reported in the literature, and includes one case of his own.

The author's patient was a 17-year-old girl with an oval abdominal swelling which projected in the midline, extended 1½ in. below the umbilicus, and above seemed lost under the transverse colon. The cyst could be moved only from side to side. The abdominal wall was movable over it. The liver was not palpable. Local pain was felt in the swelling. There was no jaundice.

At operation a grayish-white ovoid cyst, measuring 19 by 10 cm., which was attached to the anterior margin of the left lobe of the liver, was completely excised. The raw liver edge was then cauterized and sutured with catgut. The patient made a complete recovery.

The dark, greenish, viscid fluid contained by the cyst was negative on microscopic examination and sterile on bacteriological examination. The cyst wall consisted of a thin layer of dense fibrous tissue lined by a single layer of low cuboidal epithelium which was partially desquamated. An occasional duct-like formation was found embedded in the cyst wall. The diagnosis was retention cyst of the liver. WALTER C. BURKET, M.D.

Helvestine, F., Jr.: Primary Carcinoma of the Liver. *J. Cancer Research*, 1922, vii, 209.

The author considers the following questions: (1) whether the cancer is derived from the liver cells or from cells of the smaller bile ducts; (2) whether there is any relationship between the malignant growth and cirrhosis; (3) whether the growth takes place by gradual metamorphosis of liver cells into cancer cells, or by autocellular proliferation; and (4) whether the cancer is multicentric or unicentric in origin. Two cases are reported.

Because of the trabecular arrangement of the cells, the presence of capillary stroma, and the absence of proliferation of the bile-duct epithelium, the carcinoma in the first case was classed as a hepatoma.

Cirrhosis was not present in the liver tissue, and there was no hyperplasia of the liver cells. In spite of numerous points at which the cancer cells grew between parallel capillaries and were in direct continuity with the liver-cell trabeculæ, there were no transitions between liver cells and cancer cells.

The growth was unicentric in origin, the primary focus being in the right lobe, from whence it grew by direct extension without using the portal system as a pathway.

The picture in the second case, a case of secondary carcinoma of the liver, was very similar to that observed in the first case. H. A. MCKNIGHT, M.D.

Boyd, W.: Studies in Gall-Bladder Pathology. *Brit. J. Surg.*, 1923, x, 337.

Boyd states that in the past too much attention has been paid to the study of calculi and not enough to the study of the gall-bladder itself. The investigation of the pathology of the gall-bladder was carried out on material freshly brought from the operating room. The best results were obtained from a study of frozen sections after fixation in formalin and subsequent study of paraffin sec-

tions. Autopsy material was found to be entirely useless even when the tissue was studied as early as three hours after death.

By means of the dissecting microscope it was found that in marked cases of strawberry gall-bladder "the graceful, fragile, gossamer folds of mucosa are completely altered in appearance, being loaded down by the dense, opaque lipoid much as a delicate birch tree might be weighed down by a load of snow." This yellow lipoid material in the strawberry gall-bladder is soluble in alcohol, ether, and chloroform, and stains red with Scharlach R and Sudan III, and black with osmic acid. To determine the nature of the lipoid material more accurately sections were stained by Lorrain Smith's Nile-blue sulphate method. The conclusion was reached that the lipoid in the mucosa was not neutral fat, but whether it consisted of fatty acids or cholesterol was undecided.

Under the polarizing microscope newly formed esters of cholesterol were found similar in appearance to the lipoid material of the strawberry gall-bladder. By using Moleschott's sulphuric acid reaction for cholesterol, it was found that the lipoid gave the chemical and physical reactions of cholesterol ester. To determine the amount of lipoid in the gall-bladder mucosa, equal parts of absolute alcohol and ether were used in a Soxhlet extractor. The mucosa of two normal gall-bladders contained 0.51 and 1.70 per cent of cholesterol by weight. The percentage of cholesterol by weight in six strawberry gall-bladders varied between 34.60 and 60.54 per cent, the average being 47.46 per cent.

The lipoid deposits may be found distributed "in any of the coats and at any depth. Its most common place of occurrence is the surface epithelium and the stroma of the villi."

Boyd states that until the deposition of lipoid has been produced experimentally in an animal it will be impossible to state with certainty the factors which govern the formation of such deposits. He believes that the most probable factor is inflammation.

To determine the character and distribution of the lipoid from the standpoint of comparative anatomy the gall-bladders of fifteen dogs and five cats were examined. In dogs, the lipoid was present in the mucosa in every case but always confined to the epithelium, the largest deposits being in the tips of the villi. In the cats, the lipoid was present in scanty amounts in two and absent in three. No lipoid was found in the gall-bladder of the cow, rabbit, guinea pig, or frog.

In order to determine the function of the gall-bladder the abdomen of a dog was opened, a fine needle introduced into the gall-bladder, and after withdrawal of the bile, an equal amount of 2 per cent iron-ammonium citrate was injected. A series of dogs was used and after varying periods of time the gall-bladder was removed and placed in a fixative containing potassium ferrocyanide. "Even after so short a time as half an hour there were numerous blue granules in the epithelial cells and to a less extent in the stroma of the villi."

A study of cholesterol absorption was inconclusive.

W. E. Shackelford, M.D.

Bottomley, J. T.: Cholelithiasis; Cholecystectomy; Operative Injury to the Main Bile Duct; Primary End-to-End Suture; Postoperative Stricture of the Duct; Hepaticoduodenostomy; Recurrence of the Stricture; Second Hepaticoduodenostomy Over a Rubber Tube. *Surg. Gyn. & Obst.*, 1922, II, 901.

A woman 40 years of age was operated upon September 1, 1920, for stones in the gall-bladder and cystic duct. A hæmostat was placed on the cystic duct and then reapplied at a deeper level. The cystic duct was apparently free from the common duct. Removal of the gall-bladder was followed by a gush of bile, and it was then noted that a portion of the common duct was included in the forceps. An end-to-end suture was done over a T-tube. Three weeks later the tube was removed, and five weeks after operation the fistula closed. Subsequently the patient became jaundiced, and one year after the first operation a hepaticoduodenostomy was done. Six months later jaundice again developed, and in May, 1922, a second hepaticoduodenostomy was performed. Since then the patient has been well.

This case illustrates the danger and consequences of operative injury of the main bile ducts in procedures about the region of the gall-bladder, even in the hands of those accustomed to dealing with the difficulties and experienced in meeting the problems of surgery in this field. As these are the days of frequent cholecystectomies, such a case is worthy of note and comment because it sounds a warning and teaches a valuable lesson on operative repair of the injury done.

It is desirable that every attempt, successful or unsuccessful, to repair or reconstruct the main bile duct be recorded. It is probable that many cases have not been reported because the original surgical fault was the operator's and the attempt to relieve the result was unsuccessful.

Oscar E. Nadeau, M.D.

Keyes, A. B.: Cholelithiasis, Cholecystitis, and Cholangitis. *Ann. Surg.*, 1923, lxxvii, 52.

Intrahepatic stones are seldom seen at autopsy, the distance of the liver from intestinal infection and the almost continuous flow of bile rendering them less common than stones in the gall-bladder.

Duct stones do not form in the ducts; hepatic-duct stones are probably always due to an intra hepatic source; cystic-duct and common-duct stones are usually derived from the gall-bladder or, in rare cases, from an intrahepatic source.

Stones in the gall-bladder generally arise there, but may be intrahepatic in origin. Their size varies from that of a millet seed to that of a small hen's egg. Their number ranges from one to 7,000 and their color, from alabaster white, light or dark

yellow to green, brown, or black. Their shape may be spherical, oval, or facetted. They consist of layers of cholesterin and bile pigment or calcium carbonate, or a combination of all three. They are rare in infancy and childhood and in tropical climates. Their greatest frequency is after the fortieth year of age.

Factors in the production of stones are: (1) slowing of the bile due chiefly to narrowing of the duct, (2) ascending infection, and (3) excess cholesterin in the bile.

The gall-bladder usually contains dark green, almost black, bile or pus.

Conditions favoring the formation of gall-stones are: (1) external pressure by corsets, belts, etc. which causes kinking of the cystic duct and stagnation of the bile; (2) ptosis causing kinks and bile stagnation, venous kinking and engorgement, catarrhal gastro-enteritis, papillitis, or ascending common-duct infection; (3) chronic circulatory, cardiac, and pulmonary disturbances causing venous engorgement; (4) hurried irregular meals, overeating and drinking, poorly cooked food, sedentary habits, poor hygienic surroundings; and (5) certain acute and subacute infections, such as typhoid fever, gastro-enteritis and its sequelæ, and catarrhal inflammation of the duodenum with ascending duct infection.

The hypertrophied walls of a "recovered" gall-bladder containing bile, mucus, and small stones may contract and completely empty it.

Stones may remain in the gall-bladder and ducts for years without causing symptoms, and may be found only by chance at laparotomy or autopsy.

In passing through inflammatory, infiltrated ducts very small stones may cause violent pain. A small stone impacted in the cystic duct may cause colic. Various gastro-intestinal, renal, ureteral, pancreatic, and other intra-abdominal conditions may be mistaken for gall-stone colic. The first pain may be due to pericholecystitis or a true peritonitis from extending infection or a perforating ulcer. Violent contractions of a catarrhal hypertrophied gall-bladder may cause bladder or duct pain.

Stones may wander in common-duct stenosis with gall-bladder hypertrophy and in catarrhal endocholecystitis, in which there is a large bile secretion. In some cases they may pass through fistulæ between the gall-bladder and neighboring viscera. They usually do not wander from a dilated incompensated gall-bladder or in cases with little bile and marked concentric hypertrophy of the gall-bladder. Extremely large stones do not wander. Impacted stones may lead to intraperitoneal rupture of the gall-bladder or ducts.

The surgical procedure is based on the interpretation of macroscopic changes found at operation, viz.:

1. The appearance of the adjacent peritoneum with regard to inflammation, exudate, and adhesions.

2. Simple acute dilation of the normal gall-bladder by fresh bile. This generally indicates a sudden, recent acute stenosis or atresia of the common duct with normally open cystic and hepatic ducts.

3. Eccentric hypertrophy of the gall-bladder wall. This indicates open cystic and hepatic ducts and a moderate common-duct stenosis for a period of some time.

4. Icterus in gall-bladder cases. This means obstruction to the common duct with incompensation of the gall-bladder.

5. Reversal of the bile stream and ascending cholangitis. This occurs when there is hypertrophy of an infected gall-bladder with common-duct obstruction.

6. Simple atrophy of the gall-bladder. This points to an early catarrhal condition with narrowing of the cystic duct.

7. Concentric hypertrophy, a change which occurs in long-standing moderate stenosis of the common duct.

8. The condition of the liver. This is determined by inspection and palpation, and, if necessary, by aspiration, smears, and cultures.

9. The contents and the character of the wall of the gall-bladder.

Hydrops cystidis usually results from simple cystic-duct obstruction due to stone or low-grade inflammation. Empyema of the gall-bladder arises from acute ascending inflammation.

With ascending common-duct infection there may be a concomitant, ascending pancreatic-duct infection. A case of clinical pancreatitis may recover after drainage of the gall-bladder.

Drainage is more often indicated for a cholangitic liver and for the pancreas than for the gall-bladder itself. Hepatic, pancreatic, and gastric symptoms clear up following drainage.

Cholecystectomy should be done with great hesitancy. Especially when there is stenosis of the common duct, it allows the bile to drain only poorly through the already diseased bile ducts. The removal of a badly infected empyemic gall-bladder may spread the infection.

The author describes the technique of cholecystostomy as follows:

Examine the common duct; wall off the gall-bladder with hot wet pads; aspirate; open at the apex; remove all the bile, mucus, pus, and stones from the gall-bladder and cystic duct; explore the interior of the gall-bladder with the finger for stones and diverticula; pack the gall-bladder to within ½ in. of the top with iodoform gauze and extend the end of the gauze out through a rubber tube drain fastened into the gall-bladder with a double pursestring suture; suture the gall-bladder to the anterior parietal peritoneum; and close the abdominal wound around the tube.

A permanent fistula will not result. Re-formed stones can be easily removed through the anchored gall-bladder. Do not drop the gall-bladder and tube back into the abdominal cavity as this permits an overflow of bile and results in adhesions which may complicate later operative treatment.

Cholangitic infections may ascend from catarrhal common-duct cystic-duct, and gall-bladder infection, possibly with the formation of multiple intrahepatic foci or abscesses. In some cases they may cause death. The author gives the histories of five such cases of cholangitis.

WALTER C. BURNET, M.D.

Oliver, S. F.: The Etiology of Gall-Stones. *J. Lab. & Clin. Med.*, 1923, VIII, 242.

It has been noted that gall-stones are more common in women than in men. According to one investigator, infection and stagnation of bile are the probable steps in gall-stone formation, an absorption of alkaline substances taking place with the production of an acid bile which leads to catarrh with an outpouring of mucus in which pigments and salts are precipitated. Stones may be found at any point in the biliary passages. The author states that he has never encountered an acid bile and that if this explanation were correct we would find gall-stones composed largely of bile salts. In the cases of gall-stones reported in this article cystic-duct obstruction was usually present, and in a few cases there was also common-duct obstruction with jaundice.

The urine was examined prior to examination, and the urine and bile examined daily for fourteen to sixteen days after operation. All of the cases showed an increase in bile salts and pigment in the urine before operation. In some cases there was an enormous increase in bile salts without the normal coloring matter of the bile, while in other cases the pigment predominated to the exclusion of bile salts.

At operation the bile in each case was aseptically collected and tested for its various constituents. Quantitative determinations of the bile salts were made by treating the bile with absolute alcohol and then filtering it. In cases of cholelithiasis the bile-salt content was found to range from $\frac{1}{4}$ of 1 per cent to $\frac{1}{2}$ of 1 per cent. Cases of catarrhal cholecystitis, relatively few in number, were seen by the author in which the bile-salt content of the bile was low. These were treated as potential gall-stone cases and responded well to cholecystostomy.

Following operation, the bile and urine were daily collected and tested. After drainage of the gall-bladder and the removal of the stones, the urine tended to show daily decreases in bile salt and the bile showed corresponding increases. The removal of the obstruction did not lead to an immediate return to normal function on the part of the liver. In some cases normal limits were reached by the urine in six to eight days and by the bile in ten to fourteen days. About the fourth day after operation and for several days thereafter there was an increase in the urea content of the urine and a decrease in its bile-salt content. Particularly noted by the author was the fact that the urine secretion seemed to run almost parallel with the secretion of bile.

By the findings reported herein it is plainly indicated that in such cases the bile-salt content of the blood is increased. An increased content of cholesterin in the blood, together with a decrease in the bile-salt content of the bile, favors the formation of gall-stones. Bile obtained at operation from cases of gall-stones, after having been examined chemically, was placed in test tubes, sealed, and allowed to stand for varying periods of time. Normal bile was also studied. The specimens of bile which were deficient in bile salt showed a deposit of cholesterin in the bottom of the tube. Normal bile remained free from cholesterin deposits.

From these observations it appears to the author that in cases of gall-stones and obstructive jaundice there is a disturbance in bile-salt secretion and excretion manifested by an increase in bile salts in the urine and blood and a decrease in the bile-salt content of the bile. As a result of the deficiency in the bile-salt content of the bile, cholesterin tends to settle out of solution. If the condition is not remedied early, gall-stones form the end-result of the physico-chemical disturbance. Therefore cases of this character should be treated to restore the bile, urine, and blood to their noraml physico-chemical state.

GEORGE E. BAILEY, M.D.

Cohen, H.: The Gall-Bladder Surgically Considered. *N. York M. J. & Med. Rec.*, 1923, CXVIII, 97.

Gall-stones are found in 10 per cent of autopsies on adults but in 95 per cent of these cases they had caused no symptoms. The most constant symptom is pain in the gall-bladder region.

The X-ray is often a source of error. A positive finding in 40 per cent of the cases is high. The duodenal tube and bucket are of great assistance for aspiration and in the X-ray examination. Chemical examination of the blood is of value. A high cholesterin content may indicate stones. Palpation is important as it reveals rigidity and tenderness. A carefully taken history is essential.

The author discusses the pathology in detail and cites cases to illustrate the different types. Inflammation may be absent in cases of stones, but more often is present. The gall-bladder may be distended below the umbilicus. In hydrops no bile is present. The gall-bladder may be so shrunken that it cannot be found. Adhesions uniting the gall-bladder to the surrounding organs may cause severe symptoms. Cancer is usually secondary. If it is primary, gall-stones are associated with it. Gall-stones may rupture into any of the surrounding organs. Pylephlebitis is usually fatal. These cases nearly always have a leucopænia of about 4,000 and a high fever. Jaundice is not a contra-indication to operation.

The majority of cases with indefinite symptoms and all postoperative cases are medical cases. Colic is the most common indication for operation.

Hæmorrhage and shock are not unusual in uncomplicated cases. Stones may recur. Infection of the wound may cause postoperative hernia but this can be easily remedied by operation.

Gall-bladder conditions may be associated with other pathologic conditions, such as appendicitis and fibromyoma. The attacks of colic are frequently aggravated by pregnancy and may disappear at term. A cholecystectomy may be done without interrupting the pregnancy. Jaundice is as often due to a surgical as a medical condition.

In uncomplicated cases the prognosis is as good as that of appendicitis.

In conclusion the author states that when the diagnosis of gall-stones is established operation should be performed early to prevent serious complications. MARCUS HOBART, M.D.

Walzel-Wiesentreu, P.: Primary Closure of the Abdominal Wall in Operations on the Biliary Ducts, with Special Consideration of Simultaneous Operations on the Stomach and Duodenum (Ueber den primaeren Bauchdeckenverschluss bei den Operationen an den Gallenwegen unter besonderer Beruecksichtigung gleichzeitiger Eingriffe am Magen und Zwoelffingerdarm). *Arch. f. klin. Chir.*, 1922, CXX, 347.

The usual technique for cholecystectomy and drainage of the common bile duct as practiced in von Eiselsberg's clinic is described. The author warns against the use of needle ligatures in the region of the cystic artery; in one case in which these were used an injury of the right branch of the hepatic artery was overlooked and led to a fatal secondary hæmorrhage. The suturing of a flap of fat into the bed of a friable liver is found of value. A drain is always introduced next to the strip of gauze laid over the stump of the cystic duct or next to the drain of the common bile duct.

During the last two years, operation was performed in 148 cases of disease of the biliary region. In 119, cholecystectomy was done alone, and in seventeen there were simultaneous operations on the stomach and duodenum. Of the 119 cases, six ended in death, four deaths being due to postoperative peritonitis, one to postoperative hæmorrhage, and one to embolism and pneumonia. These losses were due to tampon drainage, except in one case, in which choleperitoneum followed the removal of a so-called regenerated gall-bladder with primary closure of the abdomen. In all of the four cases the biliary peritonitis originated in the bed of the liver. The ligation on the cystic duct failed to hold. Rupture of subcapsular biliary ducts in enterogenous cholangitis must also be considered. Bile entered the abdominal cavity in a considerable number of cases even when the abdomen was closed primarily. Transplanted omentum gave good impermeability. Probing of the common bile duct and choledochotomy have been done less frequently than formerly, but four transduodenal choledochotomies were successful. Primary closure of the abdominal wall was done fifteen times with good final results.

The advantages of primary closure are enumerated. The author examined the aspirated gall-bladder contents during the operation, several portions of the last part of the gauze strip removed after several days, and the last part of the introduced drain. Even when the gall-bladder contents were infected, the moist strips were free from bacteria. Streptococci were cultured from strips removed on the ninth day only in one case in which a suppurating gall-bladder was removed. Strip drainage is therefore no longer used as a routine, but cases for primary closure are carefully selected.

Of the seventeen cases in which a simultaneous gastro-intestinal operation was performed the gall-bladder was unexpectedly found diseased in fourteen. Primary closure was done in five, and strips and a drain were introduced in twelve cases. On the basis of the results in this series the author concludes that gastro-intestinal operations should not be complicated by cholecystectomy unnecessarily, but if a latent, diseased gall-bladder, changed by non-inflammatory conditions, must be extirpated, primary closure of the abdomen is indicated. If a seriously damaged gall-bladder must be extirpated, a gastro-intestinal operation is dangerous if the anastomosing suture remains in contact with the drain (Billroth I). It is therefore advisable to use the Billroth II procedure and in addition to cover the layer of sutures in the serosa lying near the drain. Tension on the sutures used in the Billroth I technique is also sometimes dangerous. Primary closure of the abdomen is of value in simultaneous operations on the gastro-intestinal tract and gall-bladder. SCHMIDT (Z).

Morley, J.: Congenital Cyst of the Common Bile Duct: with Report of Two Cases. *Brit. J. Surg.*, 1923, x, 413.

Congenital cyst of the common bile duct is a rare condition; Morley was able to collect only thirty-nine cases from the literature. To this number he adds two cases of his own.

The anatomical picture is constant, consisting of cystic dilatation of the upper portion of the common bile duct, which enlarges slowly and progressively much like a saccular aneurism. The hepatic and cystic ducts may open into the cyst separately. The intrapancreatic and intramural portions of the common duct are not involved in the cystic dilatation. Wherever investigated, the lower end of the common duct has been found patent and usually in the medial wall of the cyst. It would appear that distention of the cyst by bile causes valvular obstruction in the common duct at the point where it is suddenly reduced to its normal caliber. Such an assumption would explain the jaundice which is so frequently associated with the condition and is often intermittent, a remission being associated with diminution in the size of the cyst. The saccular nature of the dilatation, with normal ducts above and below the sac, forms a striking contrast to the diffuse dilatation of the bile ducts seen as a secondary result of gall-stone obstruction or compression of the common duct by a pancreatic tumor.

When first observed these cysts are usually about the size of a cocoanut. In the case reported by Morley there was marked obstruction of the third part of the duodenum by compression behind the superior mesenteric vessels, due to the downward thrust of the cyst on the small intestine and the root of the mesentery. Up to this point the duodenum was decidedly dilated, and beyond, it was contracted. The author believes that this duodenal ileus may account for the gastric distress recurring an hour or so after the ingestion of food.

The gall-bladder has generally been found more or less empty, but sometimes contains sufficient bile to form a small palpable swelling immediately above the large cyst.

The cyst wall varies in thickness; in some cases it is very thin while in others it is thick, tough, and opaque. In Morley's case there was no mucous membrane lining and the wall was made up of dense fibrous tissue with a layer of endothelium on the outer surface where the peritoneum was attached.

The condition first appears between the ages of 14 and 20 years, but in two cases it was present at birth. Of the forty-one recorded cases, 88 per cent were those of females. Embryological development of the liver and bile ducts throws no light on the causative factors. Budde suggests that these cysts are due to pancreatic rests in the walls of the common duct, the cells of which break down and thus originate the dilatation. There appears to be no evidence to warrant this conclusion.

The clinical manifestations consist of attacks of abdominal pain associated with a tumor and usually some jaundice. The attacks recur at irregular intervals and vary from a sensation of fullness or acute indigestion about half an hour after eating to less frequent attacks of more severe colicky nature.

The tumor varies greatly in size. It may become so large as to fill almost the entire abdomen with the exception of the right iliac fossa. The size may change from time to time, but tends to become gradually larger.

Jaundice is present in most cases. In Morley's case it was shown by only a slight tinging of the scleræ for a short time.

Two factors have combined to make the mortality very high. The first is delay of treatment until the patient cannot withstand a major operation. The second is failure on the part of the operator to recognise the condition and to adopt the proper operative procedure.

Temporary drainage of the cyst may be adopted as a palliative measure if the patient's condition is critical. However, primary choledochoduodenostomy without drainage would appear to be the operation of choice whenever the patient's condition permits. In cases demanding only temporary drainage, duct-intestine anastomosis should be done as soon as possible.

McMicken Hanchett, M.D.

Rous, P., and McMaster, P. D.: A Method for the Permanent Sterile Drainage of Intra-Abdominal Ducts as Applied to the Common Duct. *J. Exper. Med.*, 1923, xxxvii, 11.

The many attempts to maintain rubber tubes in connection with the common ducts of animals to collect bile over considerable periods of time have been so uniformly unsuccessful as to warrant the belief that such tubes will always come away within a few days. In one of the authors' recent cases, in which a longer portion of the tube than usual was left within the peritoneal cavity, the tube was found firmly fixed in place after a period of nearly two weeks and there was no sign of ascending infection with destruction of the duct wall next to the cannula such as had terminated previous observations. The tube was thinly but closely sheathed in omentum which met and joined the common duct, the entire collection apparatus being covered. Elsewhere in the peritoneal cavity there were no adhesions.

Acting on the suggestion presented, the authors developed a method whereby the total bile can be collected in a sterile state day after day, certainly for a period of months and probably for years. Their experiments were performed on dogs. A long drainage tube was inserted between the common duct and the opening in the abdominal wall. The tubes employed were pliable near the cannula. Use was made also of a curved glass tube with the soft black rubber tubing connecting with the cannula on one limb, and a piece of duodenal tubing which was to pass through the abdominal wall on the other.

By the method described bile was collected from seventeen dogs for periods ranging up to three months.

The following conclusion is drawn:

The sheath of omentum which forms about a long rubber tube left within the pertioneal cavity provides such an efficient barrier to ascending infection that the tube can be employed for the permanent drainage of the common duct, whereas a short tube will come away after a few days.

George E. Beilby, M.D.

Mann, F. C., and Giordano, A. S.: The Bile Factor in Pancreatitis. *Arch. Surg.*, 1923, vi, 1.

The authors have investigated the bile factor in pancreatitis from two chief aspects, the anatomical and the experimental.

Two anatomical mechanisms have been suggested whereby bile can be passed into the pancreatic duct. One is based on the possibility that an obstruction could occur at the exit of the common bile duct so as to convert the two ducts into a continuous channel. The relationship of the common bile duct to the pancreatic duct and their mode of entrance into the duodenum in man were studied in order to determine the percentage of instances in which there would be an anatomical basis for the hypothesis mentioned. The data proved conclusively that the number of instances in which the anatomical arrangement in the relationship of the two ducts

would permit bile to pass into the pancreatic duct is very small. The other possibility, that the sphincter at the duodenal end of the common bile duct could contract and convert the two ducts into a continuous channel, has also been investigated. The data show that in most instances in man the sphincter is located at a point where contraction will close both ducts and will not convert them into a continuous channel, but in a very small percentage of instances a small bundle of muscle fibers is found in a position where possibly it could convert the two ducts into a continuous channel. Therefore, while there is an anatomical basis for the possibility of converting the two ducts into a continuous channel, either by mechanical obstruction or the action of a sphincter muscle, the percentage of instances in which this could occur is very small.

Three lines of investigation were followed:

1. Experiments to estimate the possible pressure the existing physiological mechanism could exert to inject bile into the pancreatic duct. This pressure was found to be relatively low.

2. Sterile bile was injected into the pancreatic duct at the maximum pressure that could occur in the common bile duct. This did not cause typical hæmorrhagic pancreatitis, although definite damage of the pancreas sometimes occurred.

3. The common bile duct of goats (a species in which the main pancreatic duct opens into the common bile duct) was ligated. This did not produce acute pancreatitis. .

The investigation has proved that there is an anatomical and physiological basis for the theory that reflux of bile may occur in the pancreatic duct. The evidence indicates that such a reflux may be the cause of chronic pancreatitis. The number of instances in which the necessary anatomical conditions are present for this occurrence is very small. The possibility of bringing into play a physiological mechanism which can infiltrate the pancreas with sterile bile to an extent to produce acute pancreatitis is questionable. Granted that the necessary anatomical, physiological, and pathological factors are present and that the reflux of sterile bile under such conditions causes pancreatitis, such a cause for the condition must be very rare, few cases being on record.

A reflux of bile could not have been the cause in any of the cases of acute pancreatitis reported by the authors. Attention is called to the fact that any mechanism which will allow bile to pass into the pancreatic duct will also obstruct the flow of pancreatic juice. Furthermore, bile has been found in the pancreatic duct in the absence of acute pancreatitis. In all cases of pancreatitis the pathologist should examine the relationship of the two ducts to the duodenum and to each other to determine whether it is anatomically possible for bile to pass into the pancreatic duct. The data included in this article prove conclusively that we must look elsewhere for the explanation of the cause of most cases of pancreatitis.

Jones, D. F.: Acute Pancreatitis. *Surg Clin. N. Am.*, 1922, ii, 1125.

Pancreatitis associated with infections of the biliary tract is an inflammation of the interstitial tissues due to infection. Frequently the infection is carried through the lymphatics of the biliary system. Acute pancreatic necrosis is a necrosis of the parenchymal cells due to retrojection of bile into the duct of Wirsung or of duodenal contents into the duct of Santorini. In the author's opinion these may be two distinct diseases. Interstitial pancreatitis may be acute or chronic, but pancreatic necrosis is always acute. Interstitial pancreatitis tends to become cured whatever operation is performed. Pancreatic necrosis causes death in 70 per cent of the cases.

In 1856 Bernard caused acute pancreatic necrosis by injecting bile and sweet oil into the pancreatic duct. In 1901 Opie described a case of acute hæmorrhagic pancreatitis in which a gall-stone was impacted in the papilla of Vater so that the common duct was blocked and bile was regurgitated into the pancreatic duct. Opie found that the anatomical arrangement of the ducts favors this condition in thirty of 100 persons, and Judd and Mann demonstrated such an arrangement in nine of 200 persons. Infected or changed bile will cause greater necrosis. Archibald showed that the sphincter of Oddi of the papilla of Vater will resist a pressure of 400 to 700 mm. of water. Judd and Mann found that the contraction of the gall-bladder adds a pressure of only 50 mm. of bile. The violent muscular effort of retching increases the pressure in the biliary system to 500 and 1,000 mm. of bile.

Pancreatitis has been found in 23.8 to 50 per cent of the cases of cholelithiasis. Gall-stones were found in 50 per cent of forty-two cases of pancreatic necrosis in the Massachusetts General Hospital.

The author reviews fifty-six cases of pancreatic necrosis (forty-two from the Massachusetts General Hospital and fourteen of his own).

The condition is characterized by sudden severe epigastric pain associated with shock of greater or less intensity depending upon the extent of the lesion. After the first attack the pain may be felt also in the back. The patient becomes restless. Nausea and vomiting are persistent and obstipation is present.

The pulse is 100 to 160; often too rapid and too small to count. The temperature is subnormal for the first few hours, but gradually rises to 100 degrees F. The patient becomes cyanotic. The leucocyte count varies from normal to 15,000. The abdomen contains fluid and is very slightly tender all over. Definite localized tenderness extends from the gall-bladder region toward the left, at times being more marked to the left of the spine. There may be tenderness also in the left costovertebral angle due to involvement of the tail of the pancreas.

The results of various methods of treatment in the fifty-six cases of acute pancreatic necrosis are summarized as follows:

Operation	Total No.	Severe	Mild	Deaths	Mortality Per cent
No operation	6	6	0	6	100
No drainage or drainage of abdominal cavity	14	10	4	12	86
Drainage of pancreas including abscess	29	25	4	8	28
Drainage of pancreas without abscess	20	18	2	11	55
Drainage of abscess alone	9	7	2	0	00
Drainage of biliary system	3	2	1	2	66
Drainage of biliary system and pancreas	3	2	1	3	100
Total mortality					60 7
Total mortality not including cases of abscess					72 3

The author reports five cases. In four, gallstones were found. There was one death, that of a patient with a stone in the ampulla of Vater. In four cases the pain occurred after a heavy meal. In all of the cases the pancreas and the pancreatic capsule were drained through the gastrohepatic omentum; in addition, cholecystostomy and drainage were done in two and cholecystectomy and drainage of the common duct in one. Operation relieved the pain at once. In some of the cases the pulse and temperature fell promptly.

Drainage of the fatty pancreatic capsule or the pancreas gives the best results. The author advises operation under novocaine and gas anæsthesia as soon as the patient's condition will permit it. The ideal operation is drainage of the common duct, the fatty pancreatic capsule, and the pancreas. If the common duct cannot be drained easily, cholecystostomy should be done. If the patient's condition will allow only a slight operative procedure, drainage of the fatty pancreatic capsule alone should be done. Drainage through the left loin has not proved satisfactory. In acute hæmorrhagic pancreatitis, in which the patient's condition does not permit a prolonged operative procedure, cholecystostomy is indicated.

One patient who was operated upon seven years ago still wears a tube because of a discharge of clear fluid which possibly comes from a pancreatic cyst. The fluid is not pancreatic secretion. For the first time this patient's urine now contains sugar.

WALTER C. BURKEY, M.D.

Rigby, H. M.: Acute Hæmorrhagic Pancreatitis: Round Worm in Pancreatic Duct. *Brit. J. Surg.*, 1923, x, 419.

The author reports the case of a woman 30 years of age who was seized with sudden severe pain in the abdomen and back. The pain was especially intense in the lower abdomen. Vomiting occurred frequently and the bowels did not move for two days. When the patient was admitted to the hospital the following day her condition was grave. The pulse was 120, small, and irregular. Respirations were 30 to the minute, and the temperature was 100 degrees F. There was no history of gastric or menstrual disturbance. The abdominal wall was rigid. Tenderness was most marked over the lower part of the abdomen.

Operation revealed in the peritoneal cavity free fluid which was reddish and odorless. A second incision was made in the upper abdomen. Fat necrosis was seen and the pancreas was red, soft, and greatly swollen. Gauze tampons were passed down to the surface of the pancreas. The gallbladder showed no disease. The patient died the next evening. At postmortem examination hæmorrhagic pancreatitis and a round worm wedged in the ducts of Wirsung and Santorini were found. The terminal inch of the duct of Wirsung was bile stained and there was some dilation of the common duct.

J. A. H. MAGOUN, M.D.

Kraul, L.: Necrosis of the Pancreas: A Case of Total Sequestration (Ein Beitrag zur Kenntniss der Pankreasnekrose. Ein Fall totaler Sequestration). *Wien. klin. Wchnschr.*, 1922, xxxv, 687.

A man 46 years of age who had suffered for a long time with lumbago and cramping in the stomach ultimately developed stone colic and became jaundiced. After a period of three months a fluctuating tumor the size of an infant's head developed in the epigastrium. As there was also a high temperature, a diagnosis of abscess of the left lobe of the liver was made.

At operation, a well-encapsulated retroperitoneal cyst containing a liter of odorless pus was removed from the pancreas. The pancreas showed numerous sequestra throughout, measured 15 cm. in length, and weighed 90 gm. The cyst contents included tryptic and diastatic ferments. The patient recovered.

After the operation the assimilation of food was aided by the administration of pancreas. Transient symptoms of hyperthyroidism (protrusion of the eyes, mydriasis, a tendency to attacks of perspiration, and tremor of the hands), which appeared during the early weeks of the after-treatment, were of interest. The question whether the sufficiency of the digestion should be attributed to a vicarious appearance of the heat function or to the remains of the pancreas is left unanswered. GRAHAM (Z).

Novis: Partial Obstruction of the Pancreatic Duct by Round Worms. *Brit. J. Surg.*, 1923, x, 421.

The presence of worms in the pancreatic duct is rare. In eastern countries the author has found them free in the peritoneal cavity in cases of perforation of the intestines. In one instance obstruction was caused by a bunch of fifty-nine worms. The following case is cited:

The patient was a girl 12 years of age who, eight days before her admission to the hospital, was seized with severe colicky pain in the abdomen and vomited once. The severe symptoms then subsided but a dull pain in the epigastrium persisted. Similar attacks of pain occurred at irregular intervals

On the patient's admission to the hospital her general condition was good. At examination an indefinite tender swelling was found in the epigastrium, and the overlying recti were somewhat rigid. The urine was normal. After observation for several days, during which time there were attacks of pain resembling renal or biliary colic, a laparotomy was performed. The stomach, gall-bladder, and bile passages were normal, but the pancreas was found greatly enlarged. An incision was made in the pancreas from its head to its tail. When the pancreatic duct was opened a full-sized living round worm and a dead one were removed. The pancreatic incision was closed with interrupted sutures and the abdomen closed around a cigarette drain passed down to the pancreas. Convalescence was uneventful.

J. A. H. MACOUN, M.D.

Grekow, I. I.: Surgery of the Pancreas. The Diagnosis and Treatment of Primary Carcinoma of the Pancreas, Particularly of the Body and Tail of the Gland (Zur Chirurgie des Pankreas. Zur Diagnostik und Therapie des primaeren Pankreascarcinoms insbesondere des Koerpers und des Schwanzteiles der Druese). *Westnik Chir. i pogran. oblastei*, 1922, i, 13.

The author has had three opportunities to operate on primary carcinoma of the pancreas. All of the three tumors were situated in the body (not in the head) of the gland. Every case was characterized by a palpable tumor and very severe, colicky pains in the epigastrium independent of the taking of food.

Case 1. The patient was a man 55 years old who gave a history of pain for four months. An immobile, nodular, hard tumor was palpated in the epigastrium. Chemical examination of the stomach contents was negative. Urinalysis showed 2 per cent sugar. Slight jaundice was present. A diagnosis of cancer of the pancreas was made. At operation the diagnosis was confirmed. The tumor was situated in the body of the gland and inoperable. Death occurred four and one-half weeks after the operation.

Case 2. The patient was a woman 58 years old who had had epigastric pain for two months and attacks of diarrhœa and vomiting. When seen by the author she showed pronounced cachexia but no jaundice. A hard, immobile tumor was palpated in the region of the stomach. The clinical diagnosis was carcinoma of the transverse colon. At exploratory laparotomy an inoperable carcinoma of the pancreas was found. Death occurred from exhaustion one and one-half months later.

Case 3 is particularly interesting because it was the first case in which pancreatectomy for carcinoma gave a successful result of long duration; the patient, a woman of 39 years, is still living nine years after the operation. Treatment was sought because of pain in the epigastrium, of many years' standing, which was attributed to an old peptic ulcer with perigastritis. In June, 1912, the author discovered a very mobile, hard tumor of rapid growth in the left hypochondrium. There was no glycosuria. The patient was examined by Koerte, Bier, Israel, and Kuttner. The retroperitoneal site of the tumor was determined by means of the X-ray, and the diagnosis of tumor of the pancreas was made by Koerte.

On April 13, 1913, a laparotomy was performed by the author. A hard, nodular, mobile tumor, the size of two fists, was discovered behind the stomach. This growth had permeated the entire body and tail and part of the head of the pancreas. The ductus choledochus ran behind the gland and outside it. After removal of the tumor a piece of the head of the pancreas 1 cm. long and 3 cm. wide remained. The duodenum was exposed in its entire periphery. The stump of the pancreas was sutured with a double row of sutures and covered with a free piece of omentum. The abdominal wound was closed around a small tampon.

For a short time during the healing of the wound there were bloody stools, but thereafter recovery was good. The microscopic diagnosis was cylindrical-cell carcinoma. When the patient left the hospital on May 28 she was instructed to take a pancreatic ferment. Without this preparation she always experienced digestive disturbances, but when she continued to take it she was able to enjoy a mixed diet with no ill effects.

Up to 1918 her condition remained good, but riding in a carriage or in a railway train caused severe pain in the upper abdomen. In November, 1918, the author discovered a hard tumor, the size of a pea, in the left clavicle. Soon after this the patient left to make her home in Austria, where she is at the present time. The tumor of the clavicle, which has grown rapidly, is being treated with the roentgen rays. The latest report, dated June 4, 1922, is fairly favorable as regards her general condition, and states that the tumor of the clavicle has somewhat decreased in size. The patient is not able to get along without the pancreatic medication and occasionally experiences colicky abdominal pain.

In a review of the literature on the diagnosis and treatment of primary cancer of the pancreas the author brings out the following important facts:

The most constant symptom is severe pain in the epigastrium, calling to mind tabetic crises and termed by Dieulafoy "drame pancréatique" and by Schereschwesky "annihilating pains." Another characteristic is the hard, sometimes mobile, sometimes immobile epigastric tumor in which pulsating movements may often be recognized. Loss of function of the pancreas is not always found in cases of tumor of the body or tail of the gland; glycosuria is very inconstant.

Operative treatment of tumors of the pancreas has not been very successful. According to Koerte (1920), the literature reports only sixteen resections and extirpations of tumors of the pancreas with six operative cures. Koerte's own case of cystadenoma of the pancreas remained cured for seven years after the extirpation. PETROW (Z).

Carslaw, J., Kettle, E. H., and Dalziel, K.: Discussion on the Surgical Treatment of Non-Traumatic Affections of the Spleen. *Brit. M. J.*, 1922, ii, 1204.

CARSLAW: In recent years the indications and technique of splenectomy have been so perfected that the mortality has been markedly reduced. The Mayo Clinic reports a mortality of 10 per cent.

The real function of the spleen is still uncertain, although a great amount of experimental work has been done. It is agreed, however, that the spleen has some relation to the formation and destruction of blood cells, and that when it is removed, the liver and lymphatic glands apparently take over its function of removing used-up red cells. It is believed also that in many infections the spleen exercises a phagocytic action.

Splenomegaly occurs in infective fevers, septicæmia, protozoan infections, and a number of blood diseases which are probably of infective origin. In these cases splenectomy is not indicated. In pernicious anæmia the end-results of splenectomy are no better than those of medical treatment. Leukæmia is not an indication for removal of the spleen. The best results are obtained by splenectomy in splenic anæmia and certain types of acholuric jaundice.

KETTLE: The difficulty in understanding the pathology of the various types of splenomegaly lies in our ignorance of the true physiology of the spleen. It is known, however, that the spleen is neither functionally nor anatomically an entity such as the liver or kidney, but a constituent of a system or systems.

The place of the spleen in both the hæmatopoietic system and the reticulo-endothelial systems is well established. Except in pathologic conditions, the spleen ceases its blood-forming function at birth, but is active throughout life in removing senile or imperfect red blood cells. Probably its most important function is its phagocytic action, in which work it is associated with the bone marrow and lymph nodes. Organisms carried to the spleen are engulfed and destroyed or are kept latent for a considerable length of time.

Experimental work has been unsatisfactory. The only constant findings are that splenectomized animals show a secondary anæmia and an increase in the polymorphonuclear leucocytes.

The pathology of the spleen is also very little understood. The two conditions in which splenectomy seems to be definitely indicated are Banti's disease and acholuric jaundice, but in some other types of splenomegaly in which the spleen may be a source of reinfection or cause considerable discomfort because of its size the operation may be justifiable even though the primary cause is not affected by it.

DALZIEL: It is obvious that hæmolytic jaundice and splenic anæmia are materially benefited by removal of the spleen. Tumors, tuberculosis, and possibly the malarial spleen require splenectomy. Splenomegaly should be treated by removal of the spleen because of the discomfort it causes.

The operation presents no great surgical difficulty and is not attended by a greater mortality than is to be expected among asthenic patients. The postoperative diminution of the red cells and the increase in the white cells is no greater than is to be expected after a major operation. Little shock has been noted, and the mortality to date has been nil. No doubt hæmorrhage is to be feared, and the distention of the veins in the gastrosplenic omentum may well cause alarm. A free incision along the inner border of the rectus is generally sufficient, but when the spleen is very large a second lateral incision along the course of the tenth rib is necessary for full exposure.

After division of the costocolic membrane which supports the spleen, the vessels are controlled by means of a long clamp applied close to the tail of the pancreas. A second clamp close to the spleen prevents soiling of the peritoneum in the removal of the organ. Thereafter the vessels in the stump are ligated separately. Adhesions are apt to be troublesome in cases of splenic anæmia, but if the splenic arteries have been ligated they can be separated with the loss of very little blood if tampons are used as the separation progresses.

I. E. BISHKOW, M.D.

Haggard, W. D.: Sarcoma of the Spleen. *Surg. Clin. N. Am.*, 1922, ii, 1203.

In the case reported the illness began six years ago with pain in the left side of the back. Though sharp, this pain was not severe at first and not associated with nausea or vomiting, but it gradually became more severe. Later it was low down in the left side of the abdomen and radiated up under the left costal margin. Two years ago the patient noticed a swelling in the upper part of the abdomen on the left side. She became pale and very weak, lost a great deal of weight, and complained of sharp, darting pains along the left costal margin and in the left lumbar region.

The left upper quadrant and the left lumbar region were tender on pressure, and a movable mass was palpated in this region. The X-ray showed that the spleen was enlarged, its lower border being 2 or 3 in. below the left costal margin.

At operation, the spleen was exposed by a high left rectus incision. It was delivered with difficulty as it was adherent to the anterior and lateral abdominal wall over an area 5 in. in diameter. The pedicle was found to be in a semi-caseous condition and adherent to the fundus of the stomach. A small opening was made in the greater curvature of the stomach but was closed without leakage. The pathologic examination showed sarcoma.

New growths of the spleen must be of the connective-tissue type. Sarcoma of the spleen is the only primary form of malignancy found. The reason lies in the fact that the spleen is an organ devoid of

lymphatic connections and the routes of malignant invasion are consequently confined to direct extension or to the blood stream.

Sarcoma may spring from one of three types of splenic tissue, the trabecular or connective tissue, the splenic pulp, or the endothelial cells of the lymph spaces. According to Ewing, the character of the growth is modified to a certain extent by the type of tissue from which it grows. In other words, a sarcoma of connective-tissue origin is ordinarily a circumscribed growth within the spleen, but may be pedunculated, whereas in cases of lymphosarcoma, which grows from the pulp cells, the spleen is enlarged as a whole. A nodular spleen is found in cases of endothelial sarcoma. The first type is more or less benign, whereas the lymphosarcoma and endothelial sarcoma metastasize rapidly.

MORRIS H. KAHN, M.D.

MISCELLANEOUS

Brady, L.: Mesenteric Vascular Occlusion. *Arch. Surg.*, 1923, vi, 151.

The author reports fourteen cases of mesenteric vascular occlusion. In eleven, there was intestinal infarction. In three cases, sufficient collateral circulation developed to prevent infarction. In thirteen, the superior mesenteric vessels were involved, and in one, the inferior mesenteric vessels. The mesenteric arteries were involved in four cases, and the veins in eight. In two cases it was impossible to tell which were the cause of the infarction.

Occlusion of the mesenteric veins is always due to thrombosis, but occlusion of the arteries may be caused by embolism or thrombosis.

The average age of the patients was 45 years. The oldest was 80, the youngest 24. Eight of the patients were men; six were women. Eleven were white, and three colored.

In ten of the cases the following etiological factors were found: endocarditis with aortic insufficiency and stenosis, two; marked arteriosclerosis, two; cirrhosis of the liver, two; Raynaud's disease, one; carcinoma of the pancreas with metastases, one; polycythemia, one; and partially strangulated inguinal hernia with abscess, one. In four cases no cause for the thrombosis could be found.

In all the cases there was a history of abdominal pain and vomiting, and on examination, abdominal tenderness and rigidity were found. At the end of twenty-four hours the temperature was at least 102 degrees F. In most cases the leucocyte count was 20,000 and the pulse rate at least 120 per minute, even when the patient was seen twelve hours after the onset of symptoms. Constipation was present in all cases, but blood was found in the stools in only two. Great prostration was noted at the onset of the illness.

In most cases the condition became rapidly worse, with increasing abdominal pain and rising temperature and leucocytosis.

Clinically, the picture is indistinguishable from that of acute intestinal obstruction due to other causes than mesenteric thrombosis.

At operation, the peritoneal cavity is usually found to contain a moderate amount of serosanguinous or sanguinopurulent fluid. The infarcted intestine is moderately distended and purplish black. The involved mesentery is the same purplish black as the intestine.

In intestinal infarction immediate laparotomy is the only method of treatment. The safest measure to adopt in all cases is resection of the bowel which is undoubtedly involved and the establishment of an artificial anus.

In very desperate cases the procedure advocated by Mikulicz may be carried out. This consists in bringing all the gangrenous intestine out of the abdomen, fixing it parallel to the wound, performing an enterostomy, and, at a later stage, dealing with the gangrenous intestine.

Of the eleven cases of mesenteric vascular occlusion causing intestinal infarction, eight (72.5 per cent) proved fatal. SAMUEL KAHN, M.D

McIver, M. A.: Torsion of the Greater Omentum. *Boston M. & S. J.*, 1923, clxxxviii, 65.

Oberst first described torsion of the omentum in 1882. One hundred and forty-seven cases have been reported. Corner and Pinches had fifty-three cases in which the omental torsion was entirely within the abdomen and forty-seven cases in which it was within a hernial sac or in both a hernial sac and the abdomen. Omental adhesions may be an etiological factor.

The hernial type is diagnosed correctly more frequently than the abdominal type. McIver reports a case of the abdominal type. The patient was a healthy man 28 years of age who, four days before he was examined, experienced epigastric fullness and discomfort, a condition somewhat relieved by sodium bicarbonate. The next day a sharp knife-like pain developed just to the right of the umbilicus. This pain did not radiate. There was no nausea or vomiting. The bowels moved daily. Ultimately the pain confined the patient to bed.

At examination the abdomen was found distended and moved very little with respiration. Muscle spasm was more marked on the right side. An area of acute tenderness in the lower part of the upper right quadrant did not move with respiration. No mass was felt. The temperature was 102 degrees F., the pulse 128. The leucocytes numbered 13,800. A diagnosis of acute appendicitis was made.

Operation through a right rectus incision revealed an area of gangrenous omentum measuring 7 by 10 cm. which was strangulated by a twisted pedicle. The contiguous parietal peritoneum was inflamed. There were no adhesions. The remaining omentum and other abdominal structures were normal. The gangrenous omentum was resected. The patient made an uneventful and complete recovery.

WALTER C. BURKET, M.D.

Eastman, J. R.: A Safe Method for Drainage of Intra-Abdominal Abscesses. *J. Indiana State M. Ass.*, 1923, xvi, 6.

Eastman describes a method for the draining of deep-seated abdominal abscesses through a flank incision.

The incision is made down to the peritoneum and the peritoneum is then carefully peeled off, a tract being thus made to the abscess outside of the peritoneum.

If it is not thought advisable to open the abscess at this time, the tract is loosely packed with gauze and a tube inserted in contact with the abscess wall, dependence being placed on chemotaxis to cause rupture.

If the abscess does not open spontaneously it may be opened safely after adhesions have been formed around the gauze by passing long dressing forceps into it, through the drainage tube.

EDWIN R. TALBOT, M.D.

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Bloodgood, J. C.: The Diagnosis and Treatment of Bone Lesions: A Brief Summary of the Salient Features. *Am J. Roentgenol.*, 1923, x, 42.

This article gives briefly the salient facts collected by the author from over 1,000 records of bone lesions. The review includes only cases of tuberculous and pyogenic osteomyelitis which suggest a periosteal or central malignant lesion clinically and in the roentgenogram.

With regard to the diagnosis from the roentgen standpoint stress is laid upon the importance of examining the corresponding bone as well as the diseased bone to avoid mistaking anomalies for disease. After injuries, roentgen examinations are valuable to show possible unsuspected fractures and to reveal a pre-existing osseous lesion. The roentgenogram is also a record for comparison if the trauma excites a benign or malignant pathologic process. When the roentgen examination reveals one lesion it is well to examine all the other bones to determine whether there are others. This may give valuable information in differentiating between primary sarcoma and such conditions as metastatic carcinoma, multiple myeloma, multiple bone cysts, and chondroma. The demonstration of multiple exostoses excludes malignancy. Roentgen examinations of the chest should be a routine procedure in cases of bone lesions in order that early metastases may be discovered. The discovery of pulmonary tuberculosis may be a suggestive aid in determining the nature of a doubtful bone lesion.

Palpation gives considerable information. When the periosteal bone formation is distinctly bony, malignancy is improbable. When a soft-part tumor about the bone is palpated and the roentgenogram shows it to be composed only partially of new periosteal bone, there is definite evidence that the lesion is periosteal or a soft-part lesion with secondary involvement of bone.

Spindle-shaped periosteal growths surrounding the bone, which the older textbooks and literature stated were pathognomonic of sarcoma, the author has not found pathognomonic of this condition. Perforation and destruction of the bone shell is not indicative of malignancy. Calcified areas in the soft parts outside the involved bone and a definite clear area between them and the bone are suggestive of tuberculosis and against sarcoma.

The diagnosis of bone lesions from the roentgenogram alone is a grave mistake. The clinical history and other laboratory examinations, such as the Wassermann test, a complete blood examination, an examination of the urine for Bence-Jones bodies, and a search for foci of infection, are of great importance.

When the roentgenogram shows an evident periosteal lesion and the Wassermann test is negative, at least one dose of intravenous salvarsan should be given. The author has had four cases in which this procedure resulted in rapid improvement and a permanent cure.

As regards the localization of the lesion, certain generalizations are possible. In a recent study of all the central and periosteal lesions of the phalanges, a single example of a central sarcoma of a phalanx and no case of periosteal sarcoma was found. Of the central lesions of the lower end of the radius, 90 per cent are giant-cell tumors. Periosteal and central lesions of the metacarpal, metatarsal, and tarsal bones are very rarely malignant; up to the present time no lesion of a carpal bone not due to inflammation (usually tuberculous) has been found.

If the roentgen examination shows a distinct central lesion with a definite bone shell and with or without fracture and no extra-osseous soft-part lesion, if palpation reveals nothing, and if the patient is under 15 years of age, it is very probable that the condition is a bone cyst. The next possibility is the giant-cell tumor, rarely a chondroma, and, in a very few instances, tuberculosis. Operation is not indicated at once, especially when there is a pathologic fracture. The fracture usually cures the bone cyst, and subsequent roentgenograms will reveal rapid ossification, not only of the fracture, but also of the central area of destruction. When rapid ossification does not show, operation is indicated at once. Operation will hasten the healing of the bone cyst and is the best treatment for the giant-cell tumor or chondroma. When the roentgenogram shows no fracture, operation promises a more rapid and permanent ossification if the lesion proves to be a bone cyst and is the best treatment for the giant-cell tumor and chondroma.

If the patient is over 15 years of age and the roentgenogram shows a central lesion with a definite bony shell, with or without fracture, nothing is to be gained by delay; sarcoma cannot be excluded. The order of frequency of central bone lesions after the age of 15 years is as follows: benign giant-cell tumor; the recent and the old unhealed bone cyst; sarcoma; chondroma; myxoma.

The author's experience to date seems to show that roentgen and radium treatment cannot be expected to affect the pathologic process through a bone shell, and that radiation is employed largely for conditions in which it is neither necessary nor valuable.

As regards the method of attacking the single central bone lesion, Bloodgood states that the purpose of operation should be to remove and destroy the pathologic tissue within the bone shell by a technique which will prevent, as far as possible, the implantation of tumor tissue into the soft parts. This is best done by thermal and chemical cauterization. If the lesion is probably sarcoma, the implantation of radium into the cavity and postoperative radium or roentgen treatment are advisable. Immediate bone transplantation into large cavities has been unfavorable in the author's experience except in bone cyst, but in this condition it is not necessary.

A cure of central sarcoma is obtained after amputation in less than 10 per cent of the cases. Because of this fact and because it is the rare central lesion and often difficult to differentiate from variants of the bone cyst and the giant-cell tumor, the treatment described seems justifiable when there is a central tumor of bone with an intact bone shell, even when the gross appearance at operation and the microscopic picture strongly suggest sarcoma.

The problem of diagnosis and the plan of attack are essentially different in periosteal bone lesions as compared with central bone lesions. Age is of diagnostic significance. It is very difficult in many instances to distinguish the periosteal sarcoma with or without bone formation from the benign periosteal lesions with or without bone formation.

Up to the present time the author has obtained only two permanent cures after amputation for periosteal sarcoma. Recently he has had two cases which reacted favorably to radium. In one, the improvement has continued for two years; in the other there has been a recurrence after eighteen months, but radium treatment is again causing improvement. Because of this experience Bloodgood believes that every case should receive salvarsan first, and then roentgen and radium treatment. If there is no improvement, amputation should not be done unless a microscopic diagnosis is made, except in cases of periosteal sarcoma in which a positive diagnosis from the roentgenogram is possible.

Recent experience has demonstrated that the number of benign periosteal lesions of single bones resembling periosteal sarcoma in the roentgenogram and clinically is increasing. As cures of periosteal sarcomata are so infrequent even after amputation, and as the possibility of error is still great, amputation should be considered only when all other measures have failed. Especially in cases of traumatic and infectious ossifying periosteitis difficult to differentiate from sarcoma, there is always a possibility of spontaneous recovery.

ADOLPH HARTUNG, M.D.

Weglau: The Traumatic New Formation of Bone: Myositis Ossificans and Parosteal Bone Cysts (Ueber traumatische Knochenneubildung: Myositis ossificans und parostale Knochencysten). *Beit. z. klin. Chir.*, 1922, cxxvi, 432.

On the basis of the findings in four cases the author attempted to determine: (1) whether the source of origin of the ossification is the periosteum or the muscle connective tissue, (2) what conditions favor the ossification, and (3) whether the final result is a true new formation, an inflammatory process, or a degeneration.

In the first of the four cases there was a formation of bone within the muscle after a chemical injury due to salvarsan and an effusion of blood into the tissues. The injury did not affect the periosteum of the humerus in this case; at any rate, not so as to cause the penetration of small pieces of periosteum into the muscle. The matrix of the bone formation therefore must have been the muscle connective tissue which showed proliferative processes with degeneration of the fibers and transition stages to newly formed spongy bone.

The second and third cases showed very advanced changes in close relationship to the bone processes. The fact that a considerable area of the femur was stripped of periosteum indicated that the periosteum was a factor in the new formation of bone. On the other hand, as the microscopic and macroscopic findings were very similar to those observed in the first case, the muscle connective tissue may have been in part responsible.

The fourth case was similar to Cases 2 and 3. The striking feature in this instance was the fact that the ossification was found far from any normal bone and in the center of a peculiar germinal tissue. The origin of the latter might have been the muscle connective tissue. The periosteum and the muscle connective tissue were probably the bone-forming matrix.

The main mass of bone in the last three cases was attached to the femur. In the fourth case the ossification originated in the granulation tissue. It is probable, therefore, that the new formation of bone proceeds more intensively and rapidly from the periosteum than from the connective tissue. In the process of ossification, cells with large vesicle-like nuclei are formed, and these, through the breaking down of their protoplasm, unite to form slowly calcifying giant cells.

In every case the exciting cause of the ossification was trauma—in the first case the unsuccessful

injection of salvarsan, and in the last three cases a severe blow. The fact that salvarsan may cause tissue necrosis is well known. In every case the effusion of blood is a favoring factor. The rôle of such an effusion in the healing of fractures is also recognized.

Proximity of the injured area to the large bones is undoubtedly an important factor, particularly if the periosteum is injured. Under such circumstances irritation of the muscle connective tissue is established and makes possible the direct transportation of calcium from the shaft of the bone into the nearby tissues. It must be assumed that there is undoubtedly also a predisposition to bone formation.

The relatively rapid growth and the size of the bone tumors suggest a true new formation, but the process does not progress any further. On the basis of the roentgen-ray, the clinical, and the microscopic examinations it appears that traumatic myositis ossificans is an inflammatory reparative process in which, following an injury, metaplastic bone is formed from the muscle connective tissue as well as from the injured periosteum, in the presence of a predisposition and other favorable conditions.

CREITE (Z).

Bloodgood, J. C.: Bone Cysts (Osteitis Fibrosa): Variety—Polycystic Osteitis Fibrosa. *J. Radiol.*, 1923, iv, 1.

This article is largely a résumé of other articles on the same subject published previously. It covers the subject from the standpoint of direct and differential diagnosis and treatment. In addition, five cases are reported in detail which differ from the ordinary case of bone cyst in the gross and microscopic pictures of the inflammatory tissue filling the bone shell.

Bone cysts are grouped by the author according to the age of onset, the number of bones involved, and the peculiarities of the clinical course. The clinical manifestations and roentgen findings are not pathognomonic. The gross findings encountered on opening the bone shell are classified into six main groups; most of these are not found in any other bone lesion, but the gross and microscopic findings in solid osteitis fibrosis have been mistaken for those of sarcoma.

Brief mention is made of the healing of bone cysts brought about spontaneously by ossification after accidental fracture or without it, or after fracture or crushing caused purposely. The indications for operation are mentioned; also the methods employed. The author has found radiation unnecessary in the treatment of bone cyst and osteitis fibrosa.

ADOLPH HARTUNG, M.D.

Bloodgood, J. C.: Bone Diseases—Osteoporosis or Lipomasis from Fixation and Non-Use. *J. Radiol.*, 1922, iii, 528.

In a previous article upon the same subject published a short time ago the author recorded the findings noted comparatively soon after the development of the condition caused by fixation and non-use. In this article attention is called to the persistence of changes long after the patient has been clinically well and there has been complete restoration of the function of the joint. Two cases are cited and roentgenograms are shown which were made eight years later than the roentgenograms shown in the previous article in the first case and four years later in the second case. The irregular markings of darker shadows suggest excessive new bone formation, that is, the old area of osteoporosis has now become osteosclerosis, but the architecture of the involved area has not been restored to normal.

From these findings the author concludes that the bone affected by diffuse osteoporosis due to non-use is not restored to normal when it heals. Cases of this kind have an important bearing on industrial and accident insurance and workman's compensation for if a patient is examined with the X-ray because of recent pain or injury, pictures of the same kind may be revealed if there was a previous injury followed by a long period of non-use. Therefore the evidence of previous injuries, fixation dressings, and non-use should always be recorded.

It is evident from these cases that there is a field for roentgen study of the changes in bone after contusion and after prolonged fixation and non-use. These studies should picture the bone not only soon after the injury, but also at intervals throughout a long period.

ADOLPH HARTUNG, M.D.

Glover, D. M.: Osteopsathyrosis: Report of a Case with Roentgenograms of Eleven Different Fractures in the Same Patient. *Arch. Surg.*, 1922, v, 464.

The patient was a boy of 7 years who had a negative family history. He sustained multiple fractures of the long bones, and died following what was probably a fracture of the skull. Eleven fractures were demonstrated by the roentgen ray, and two other probable fractures were not found. All of the fractures were due to comparatively slight injury, and with the exception of those immediately preceding death, united readily. One of the early fractures showed excessive callus formation, and another, a small cyst-like rarefaction of the bone.

The principal theories advanced as to the etiology of this condition are that the disease is an affection of some central organ (osteotrophic organ) which furnishes some substance necessary for the normal formation and nutrition of bone; that it is of nervous origin; and that it is due to some disturbance of nutrition affecting the entire bone system during fetal life.

Mention is made of the dark blue tint in the scleræ which is ascribed to a deficiency of the sclerotic fibrous tissue allowing the pigments of the choroid to show through.

The mortality of the fetal type of the condition is almost 100 per cent. When the second decade of life is reached the fractures are few, and after that time, the prognosis is fairly good.

The diagnosis is usually easy because there is no other congenital disease in which multiple fractures occur. Rickets and syphilis occasionally cause fractures in young children, but it is rare that more than two or three fractures occur in the same person as a result of these affections.

The treatment recommended is care to prevent deformities and the administration of cod liver oil and phosphorus. Care to prevent fractures is the most important single factor in the treatment of osteopsathyrosis.

PHILIP LEWIN, M.D.

Davis, G. G.: Osteosclerosis Fragilis Generalisata: Marmorknochen: Albers-Schoenberg Disease. *Arch. Surg.*, 1922, v, 449.

The author reports a very interesting case of bone pathology, the tenth case of the kind to be reported in any language and the first to be reported in English.

The patient was a boy of 11 years who entered the hospital with a fracture of the right leg, the result of a rather trivial injury. Previously he had had other fractures following slight trauma. The roentgen-ray study of the entire skeleton revealed a generalized abnormality of the bone structure characterized by marked, irregularly increased density of some portions of the bones and rarefaction in other areas. In the long bones, the tendency was toward marked narrowing of the medullary canals in the middle third, due to thickening of the cortex, the ends of the shaft presenting an expanded appearance and showing thinning of the cortex and a coarsely mottled effect due to increased density in the marrow cavity. The small bones, such as the vertebræ, carpals, and tarsals, presented a generalized increased density with absence of bone structure. The epiphyseal lines were all present and normal in width, but had slightly irregular margins. The epiphyses showed a general increase of density with absence of bony structure, but appeared normal in size and outline.

PHILIP LEWIN, M.D.

Ghormley, R. K.: A Case of Congenital Osteosclerosis. *Bull. Johns Hopkins Hosp.*, Balt., 1922, xxxiii, 444.

A careful review of the literature failed to reveal a case in which the condition described was diagnosed during life. Several cases reported were diagnosed at autopsy as osteosclerosis, the condition being regarded as congenital in some and as associated with a disturbance of the blood-forming organs in others.

The author gives the history and the findings of the physical examination in his own case and includes several illustrations. On first seeing the case in the dispensary, he regarded it as a beginning epiphyseal separation of the head of the left femur. Roentgenograms of the pelvis taken at that time showed a peculiar density of the bones. Several roentgenograms made later confirmed this finding. Roentgenograms of all the bones revealed practically the same condition throughout the entire skeleton. In addition, the vertebral bodies showed marked density at both poles, there was thickening of the cortex of the ribs, the marrow cavity was apparently obliterated at certain points, and there was definite thickening of the cortex, especially in the distal portion, of the long bones, particularly the femora and humeri. The skull was thicker than normal. In both femoral necks, and especially in one, there seemed to be a breaking down of the bone just below the epiphysis, the latter structure being displaced inward and downward.

The bones of the patient's mother were shown by the X-ray to be normal, but the father's bones were exactly like those of the child.

PHILIP LEWIN, M.D.

Cone, S. M.: The Pathology of Osteitis Deformans, Paget's Disease. *J. Bone & Joint Surg.*, 1922, n.s. iv, 751.

The author gives a very complete description of the pathology of osteitis deformans, having had the opportunity to study the bones and the tissues of organs in a case whose clinical history had already been completely reported.

Unfortunately, neither the pituitary gland nor the skull bones could be obtained, but otherwise the report is complete. This abstract will be confined chiefly to the bony pathology.

The author concludes that osteitis deformans presents osteoporosis with disappearance of bone by lacunar absorption and chemical (vital fluid?) dissolution, accompanied by new formation of bone. In the case under discussion the new formation was not so marked as in the cases reported by others. The active process seemed to have been completed.

There was evidence of breaking down of bone—that is, bending of trabeculæ crushing down on neighboring cancelli, obliterating some canals and assisting in the formation of others.

There was marked vascular degeneration with varicose vessels, thrombosis, congestion, leakage with œdema, and minute hæmorrhages. The surrounding tissues were modified to a certain extent as evidenced by changes in vessels, nerves, muscles, and tendons. It is suggested that this was due to bone absorption throwing them in contact with unaccustomed (unusual) neighboring material. In the case of muscle attachments the distortion and microscopic changes were especially marked.

In certain areas the bone itself showed reversion to a fibrous type; there was a metaplasia to myxomatous tissue, and the marrow was myxomatous, fibrous, or cellular, the bone cells taking part in the process. In some of the bones there was what appeared to be a reversion of marrow to the embryonic type showing small and large round cells, megalokaryocytes, and normoblasts. Possibly this was compensatory. The bone-cell multiplication was an essential part of the disease.

The pathologic changes varied in the different bones and in various parts of the same bone.

There was evidence of analogous conditions to bone in the organs, tissues, and nerves. This was most evident in the tendency to overgrowth-cell multiplication. The circulation had been erratic for years, with intermittent compensation and the reverse, the bones, organs, and soft parts being correspondingly affected. The changes involved corresponded to those found in chronic inflammation or in resolution of acute inflammation where repair is the most important factor.

The author believes that in this condition there is a primary blood-vessel pathology similar to that in hereditary or acquired syphilis, with accompanying bone changes such as are found on a small scale in chronic passive congestion and infections of a chronic character. It is not at all improbable that malaria, typhoid, influenza, erysipelas, or parasites may produce such vascular lesions with local and general osteitis deformans.

The article is supplemented by a complete bibliography and an excellent discussion by Morrison and Myers. PHILIP LEWIS, M.D.

White, E. P. C.: Osteitis Deformans in Monkeys. *Arch. Int. Med.*, 1922, xxx, 790.

The author reports three very interesting cases of osteitis deformans found among 6,570 consecutive postmortem examinations in the laboratory of the Philadelphia Zoological Society. These were the cases of three monkeys, a red woolly monkey, a black spider monkey, and a brown cebus monkey. The pathologic reports are given in detail. The cases are of interest because:

1. They are typical of Paget's disease as it has been found in man.
2. They show the same general type of inorganic metabolism as that exhibited in man.
3. Alkali hunger was shown by one of the monkeys and in two clinical cases before the development of the deformity and disappeared after the deformity was established.
4. The disease developed in animals fed on a diet insufficient in its inorganic and vitamin content, to which an excess of calcium was added.

From his study White concludes that Paget's disease may be merely one stage of a deficiency disease; that it may be a reparative response through: (1) a disordered neurotrophic mechanism, (2) perversion of the calcium-governing glands which have been disturbed by an improperly balanced diet, or (3) the addition of an excess of calcium to the diet of an animal whose body fluids are unable to hold it in solution because of a faulty diet or other factors. PHILIP LEWIS, M.D.

Frieberg, A. H.: Osteochondritis Dissecans. *J. Bone & Joint Surg.*, 1923, xxi, 3

The author reviews the literature and reports four cases of osteochondritis dissecans of the knee and one case in which the elbow was involved. While for the present, at least, this interesting condition must be considered a result of trauma, Frieberg believes it is only an indirect result. He suggests that it is brought about through the coincidence of several factors: the terminal arterioles present in the end of the femur may be injured by an abnormally long tibial spine when the knee is in a position of flexion and the tibia is rotated outwardly. Frieberg found by examination of cadavers that when the knee is flexed and the tibia rotated outward even a normal tibial spine may be made to impinge on the posterior crucial ligament. If either tubercle of the tibial spine is abnormally long, it is conceivable that impingement might take place with sufficient force to cause a vascular injury resulting in the death and separation of the portion of bone involved. The author draws attention to the fact that in one case, as in a case reported by him in 1910, the opposite knee became affected later.

The treatment is arthrotomy with the removal of all loose bodies. An X-ray examination should be made of every joint lesion of subacute or chronic character, as by this means a diagnosis can be made before locking has occurred or a loose body has been felt at a point distant from its bed. Experience has shown that loose bodies are for a time attached by a pedicle and operation may then be performed through a comparatively small opening. When the bodies have wandered from the site of their formation the procedure is more difficult.

S. C. WOLDENBERG, M.D.

Winslow, N.: Suppurative Osteomyelitis Due to the Colon Bacillus. *Ann. Surg.*, 1922, lxxvi, 695

This report of a case is particularly interesting as it deals with a comparatively rare condition. Winslow also reviews six other cases of osteomyelitis. In one, the condition followed a gunshot fracture of the tibia and therefore did not represent the ordinary type of osteomyelitis. As in five cases there had been a previous attack of what seemed to be typhoid fever, it is possible that the organisms recovered might have been those responsible for the typhoid-like illness, since both of these organisms belong to the same family group.

All age groups were represented. The structures involved were the femur and the costal cartilages in three cases each. In two cases there was a mixed infection and both of these patients died.

Winslow's case began as a typical attack of osteomyelitis, an abscess developing, rupturing spontaneously, and apparently healing before the patient was admitted to the hospital. From the drainage incision there escaped a large amount of foul-smelling, thick, yellowish pus from which the colon bacillus was recovered. Winslow does not believe there was any connection between the attack of typhoid fever twenty years before and the osteomyelitis. DENNIS W. CHILD, M.D.

Thompson, J. E.: Tumors of Bone. *Surg. Clin. N. Am.*, 1922, ii, 1403.

The author mentions the recent advances in the study of tumors of bone, and states that the majority

of museum specimens labeled "giant-cell sarcoma" are now known to be benign giant-cell tumors.

Paget, in 1854, described very clearly a group of central tumors of bone which he called "myeloid tumors," and regarding which he said, "they are not apt to recur after complete removal, nor have they, in general, any features of malignant disease."

Thompson reports three cases of myeloma, or benign giant-cell tumor. In one, amputation was done. The other two were treated by curetting. The author believes that the amputation was unnecessary, and that amputation is done too frequently in such cases on the erroneous diagnosis of malignancy.

Another case reported was a case of very malignant osteogenetic sarcoma of the femur. Amputation was done below the trochanters. Six years after the operation the patient reported perfect health.

The cellular elements from which osteogenetic sarcomata may arise are present in the periosteum, in the bone, and to a less degree, in the marrow cavity. Round-celled sarcomata of a very malignant type may arise from the lymphocytic cells in the marrow, and frequently make their appearance in several bones simultaneously.

DANIEL H. LEVINTHAL, M.D.

Bloodgood, J. C.: Bone Tumors. Metastasis to the Lungs from a Pure Myxoma. *Ann. Surg.*, 1923, lxxvii, 106.

Two cases reported by Bloodgood establish fairly definitely the fact that pure myxomata may give rise to metastasis as well as to local recurrence.

In the first case the metastasis to the lung appeared about ten years after the first operation, and in the second, four and one-half years afterward, which is late as compared with the metastasis of true sarcoma of bone. In Bloodgood's opinion there is a pure myxoma of bone with a distinct gross and microscopic appearance. Grossly viscid, gelatinous tapioca-like material, which may be blood-stained, exudes under pressure from the bone capsule of the tumor.

Microscopically, frozen sections are more characteristic than those made after long hardening. The pure myxoma is rare. Frequently the tumor is mixed with cartilage, but more often with sarcoma. Osteitis fibrosa and pure chondroma have been diagnosed as myxoma or myxochondroma. Osteitis fibrosa is distinctly benign, while pure chondroma recurs only when improperly or incompletely removed. There is nothing characteristic in the clinical or X-ray picture of either the periosteal or the central lesion. Therefore if an exploratory incision is made for diagnosis, the possibility of myxoma should always be borne in mind and the electric cautery and chemical cauterization with pure carbolic acid followed by alcohol and a 50 per cent solution of zinc chloride should be employed to prevent transplantation of the tumor tissue.

RUDOLPH S. REICH, M.D.

Hansen, O. S.: Multiple Myeloma. *J. Am. M. Ass.*, 1922, lxxix, 2059.

The author reports seven cases of multiple myeloma, four in men and three in women. The average age at onset was 35 years. The duration of symptoms from their onset to death ranged from three to twelve months, the average being seven and one-half months.

Bence-Jones protein was found in the urine of only one of the seven cases after many tests had been negative. In several the diagnosis was not made before autopsy. The author believes that multiple myeloma should be suspected in cases of backache or pain in the bones which cannot be explained satisfactorily otherwise.

The test for Bence-Jones protein should be repeated as the absence of this protein does not speak against a diagnosis of myeloma.

PHILIP LEWIN, M.D.

Brown, K. P.: A Case of Solitary Cyst in the Humerus. *Edinburgh M. J.*, 1922, n.s. xxix, 306.

The case reported was that of a woman 28 years of age who was admitted to the hospital with a fracture of the lower end of the humerus. A few weeks after a cold in October, 1921, the patient had complained of an ache which radiated from the elbow to the shoulder and occurred at irregular intervals. About June, 1922, she felt her left arm crack while hanging up clothes. The Wassermann test was negative.

Examination of the left arm revealed a hard, smooth fusiform swelling 2½ in. in length at the lower third of the humerus. No cracking could be elicited. The X-ray revealed a cystic area in the center of the bone with partial destruction of the compact bone and a fracture through this weakened area. Roentgenograms of the right humerus, the femora, and the tibiæ were negative.

The cyst contents were curetted and the bony wall surrounding the cavity left smooth.

Microscopic examination of the cyst contents revealed many bony spicules surrounded by cellular fibrous tissue. A small area of hyaline cartilage was also seen.

Bone cysts are related to osteitis fibrosa. They occur most frequently in the humerus, tibia, and femur, usually near the epiphyseal cartilage. The lower end of the humerus is rarely involved. The etiology is obscure.

The diagnosis is based upon the history, microscopic examination, and roentgenogram.

JOHN MITCHELL, M.D.

Stewart, M. J.: A Large Myeloid Sarcoma of the Radius in Which the Tumor Is White Throughout. *Brit. J. Surg.*, 1923, x, 322.

Myeloid sarcomata are generally of a maroon color. This may be prevalent throughout the whole tumor or affect only part of it. The red areas contain numerous multinucleated giant cells and red blood corpuscles, or hæmorrhagic extravasations.

Some of the white portions are highly cellular, actively proliferating myeloid tissue with a large number of giant cells.

Paget describes myeloid sarcoma in these words: "On section, the cut surfaces appear smooth, uniform, compact, shining, succulent, with a yellowish, not a creamy fluid. A peculiar appearance is commonly given to these tumors by the cut surface presenting blotches of dark or livid crimson, or of a brownish or a brighter blood color, or of a pale pink, or of all these tints mingled, on the grayish-white or greenish color basis. This is the character by which, I think, they may best be recognized with the naked eye, though there are diversities in the extent, and even in the existence, of the blotching. The tumor may be all pale, or have only a few points of ruddy blotching, or the cut surface may be nearly all suffused, or even the whole substance may have a dull modena or crimson tinge, like the ruddy color of a heart or that of the parenchyma of a spleen."

The author reports the case of a girl 6 years of age who had had a swelling of the distal half of the left forearm for three years. During the last three months the growth of the tumor had been rapid. No history of injury was obtained. The tumor seemed to spring from the radius. It was firm, regular, and not tender. X-ray examination showed its site to be the distal half of the radial diaphysis. The central part contained no bone. The part excised for study was white and contained numerous osteoclast-like giant cells. The surrounding muscle and other soft parts had been invaded.

Amputation was done. The axillary glands were not touched as the patient suffered severe shock. When she was discharged from the hospital no axillary glands were palpable.

The microscopic structure of the specimen was that of a typical myeloid sarcoma. The preponderating tissue had a mixed and spindle-cell groundwork with many multinucleated giant cells of the osteoclast type. There were many areas of acellular tissue.

Whether they are endosteal or periosteal, sarcomata of bone which are white are almost invariably highly malignant. The presence of enlarged axillary glands on the same side as the tumor suggests malignancy, but so far no conclusive evidence has been produced to show that the enlargement is due to metastatic deposits. The author suggests that it is caused by the absorption of blood and the disintegration products of the tumor by the lymphatics.

JOHN MITCHELL, M.D.

Jean, G.: Brachydactylia Due to Congenital Shortening of the Metacarpals (Brachydactilies par raccourcissement congénital des métacarpiens). *Rev. d'orthop.*, 1922, 33, xxix, 535.

Congenital shortening of the metacarpals is a rare malformation. The first cases were reported by Sandifort in 1778. Jean reports the case of a man 20 years of age who had shortening of the right hand, and whose father and brother showed a similar malformation. The patient's third finger was much shorter than the others, but was not atrophied. The X-ray revealed absence of the distal part of the fifth metacarpal and fusion of the rest of it with the fourth metacarpal. The fourth metacarpal was of normal length but its diaphysis was thinned and curved slightly inward and its head much smaller than that of the second and third metacarpals. There were no malformations of the carpals or the forearm and no other anomalies.

Brachydactylia is usually observed in the first and fifth metacarpals. Generally the shortening is at the expense of the distal part of the bone. Synostoses and syndactylia are common; both are shown by the X-ray.

The pathogenesis of shortening of the metacarpal must be sought in the mode of vascularization of these bones. Ossification of the metacarpals does not occur until the eighteenth month of life, and malformation may result if the circulation is deficient. The finger has its own independent vascularization. The fact that such malformations are more common in the first and fifth fingers may be explained by the evolution of these bones. Probably also certain phylogenetic factors such as amniotic compression and embryonic infection are responsible.

W. A. BRENNAN.

Henderson, M. S.: Chronic Non-Inflammatory Lesions of the Knee Joint. *Arch. Surg.*, 1924, vi, 115.

For the convenience of the surgeon, the knee joint may be divided into an antero-superior compartment (the suprapatellar pouch), an antero-inferior compartment, and a posterior compartment, each of which may be subdivided into internal and external sections.

Sprains. Sprains of the knee joint are not uncommon. The internal lateral ligament is most often involved. The differentiation between damage of the internal semilunar cartilage and sprain of this ligament is not always easy, but in cases of sprain locking does not occur and there is usually a full range of passive motion. Rest in the position of extension followed by baking and massage usually gives relief. If pain and tenderness persist, raising the inner side of the sole and heel often relieves by removing the strain from the internal ligament.

Ruptures of the crucial ligaments. This condition is rare. If the anterior crucial ligament is torn, hyperextension of the knee is permitted and the femur slides backward on the tibia or the tibia slides forward on the femur. When the posterior crucial ligament is torn, the femur may be pushed forward on the tibia or the tibia pushed backward on the femur. Treatment by the application of a plaster of Paris cast with the leg slightly flexed often results in excellent function.

Intra-articular fractures. Severe direct trauma may cause these fractures. Little can be done in such cases without arthrodesis, which most patients will not permit. Prolonged fixation in a cast or splint is apt to leave a stiff joint. Early motion is essential,

and may be carried out under extension with a modified Thomas splint.

Recurring dislocations of the patella. The patella always becomes dislocated outward. Many satisfactory operations have been devised. The author reefs the inner capsule and overlaps it broadly after lengthening the outer capsule. The condition is more common in women than in men, and there is a familial tendency.

Old ununited fractures of the patella. Treatment is difficult. The object is to obtain approximation of the fragments without tension, and then bony union. The author makes a long, straight incision in the middle line, exposes the fragments, and freshens the ends of the fragments until good bone is reached. Beef-bone screws have proved satisfactory to hold the fragments in coaptation. In the after-care, slight passive motion is begun in about four weeks, and soon thereafter slight active motion is encouraged.

Intrinsic mechanical derangement of the knee joint. The semilunar cartilages are the most common cause of mechanical derangement. The chief offender is the internal semilunar cartilage. The most common tear of this cartilage seen in the Mayo Clinic is the so-called "bucket-handle" type. Because of its loose attachment, the external semilunar cartilage is less often caught; when it is caught, however, it is more apt to be detached at its periphery and crumpled rather than torn.

A primary locking of the knee should not be operated on, but should be reduced by applying pressure over the anterior aspect of the internal semilunar cartilage and rapidly extending the knee. When lockings are frequent, surgery is necessary. The antero-internal incision is the incision of choice for the removal of the internal meniscus.

Another cause of mechanical derangement is the presence of osteocartilaginous loose bodies which cause locking by becoming caught between the joint surfaces. Their formation is due to osteochondritis dissecans, hypertrophic arthritis, or osteochondromatosis. In osteochondritis dissecans there are rarely more than one or two bodies, which arise from the internal condyle of the femur. In hypertrophic arthritis loose bodies may be formed by the breaking off of osteophytic growths. In osteochondromatosis, osteocartilaginous bodies are formed from the synovial membrane and may be very numerous. Removal of such foreign bodies is indicated. The split-patella incision is the incision of choice for the removal of bodies found in the anterior compartment, while posterior lateral incisions are those most useful when the bodies are in the posterior compartment.

Martin, W.: Sciatic Neuritis and Its Relation to Flat-Foot. *Am. Med.*, 1922, xxviii, 692.

Inflammation of the sciatic nerve may involve the perineural tissues or the nerve trunk. Neuritis of the trunk is not so common as the less severe type. Perineuritis is of shorter duration and more amenable to treatment than neuritis of the nerve trunk. An inflammatory exudate thrown out is deposited in the sheath itself, but soon involves other tissues. Organization of this exudate results in pressure which in turn interferes with the nutrition of the nerve cells. Loss of motion or sensation or both, and loss of muscular strength or atrophy may result.

Limitation of motion is the first severe effect of the adhesions caused by the exudate. In the interstitial form of neuritis, pain is severe and cell nutrition soon disturbed.

At the lower third of the thigh the sciatic nerve divides into the external and internal popliteals which are continued through the tibials to the foot. Inflammatory conditions involving the tissues along the tendon of Achilles will influence the relative position of the astragalus to the other bones of the foot, causing marked rotation or other misalinement of the heel due to tenseness or laxity of the tissues. It will also cut off the nutrition of the nerves. The author cites a case of flat-foot resulting from sciatic neuritis secondary to tooth infection.

In such a case the source of the infection must be eliminated before the flat-foot can be treated successfully. For good results the treatment must include both orthopedic and electrotherapeutic measures.

The author uses the static wave to express exudate from the tissues. This has also a sedative effect upon the inflamed nerve and a toning action on the nerve cells. Relief from exudate pressure lessens the danger of atrophy.

When the nerve becomes less sensitive, the slow sinusoidal current is employed to restore the tone of the muscles and ligaments. JOHN MITCHELL, M.D.

Moffat, B. W.: Isolated Disease of the Scaphoid. *J. Am. M. Ass.*, 1923, lxxx, 87.

Forty-two cases of isolated disease of the scaphoid have been reported since the first case described by Koehler in 1908. The disease has been mistaken for tuberculosis, but tuberculosis has not been demonstrated and the course and final outcome are not the same. The pathology is unknown.

Etiological factors suggested are osteomyelitis, tuberculosis, syphilis, vascular change, trauma, and endocrine disturbance. As a rule the Wassermann reaction is negative, but in one case reported the teeth were notched and the child's mother had a 4+ reaction. Trauma may injure the ossification center or tear off the nutrient vessels.

The clinical symptoms are a slight limp and discomfort or mild pain in the scaphoid region. The scaphoid is enlarged and tender but an abscess never forms.

The treatment is immobilization for three to ten weeks. The prognosis is excellent.

CASE 1. The patient was a child 7 years of age. Limping began two weeks before he was examined by the author. There was no history of trauma. The family and personal histories were negative. Pain occurred only at night. A prominence over the scaphoid and tenderness on pressure were noted. The feet were markedly pronated. Immobilization for about six weeks caused disappearance of the

tenderness in the scaphoid. There was no recurrence up to two weeks later.

Case 2. The patient was a child 6 years of age who limped and complained of slight pain. The foot had been run over by a truck about three months previously. This accident had caused disability for only four days. When the patient was examined by the author the foot was abducted and pronated and the scaphoid prominent and tender. The roentgenogram made just after the accident was negative, but when the patient came for treatment for the limp and pain the X-ray showed typical isolated disease of the scaphoid. A cure was effected by immobilization in a cast for about six weeks.

Case 3. A child 7 years of age suffered an injury to his foot in July which disabled him for four days. A roentgenogram made in December showed Koehler's disease of the scaphoid. A cure was obtained after immobilization in a cast for a month.

Case 4. This case was that of a child 7 years of age who had had a swelling and limp in the right foot for two months. The foot had not been injured. Tenderness was present in the tarsus. A fluctuating mass appeared on the dorsum, broke, and discharged for several months. Necrotic bone was curetted from the cuneiforms and scaphoid and from the left elbow. The condition improved under arsphenamin treatment.

In the author's opinion the disease is caused by injury causing hypertrophy of the scaphoid which, being cartilaginous up to the fourth year of age, becomes compressed, the soft, newly formed osseous portion spreading out laterally.

William A. Clark, M.D.

FRACTURES AND DISLOCATIONS

Young, A.: A Five-Year Survey of the Routine Treatment of Fractures by Operative Methods. *Brit. M. J.*, 1922, ii, 1209.

During the period of five years from May 1, 1917, to May 1, 1922, Young treated 693 cases of fracture. General anæsthesia was induced in 459 cases. Open operations were performed in 272 cases (39.25 per cent), and direct fixation was employed in 103 cases (37.86 per cent). Wiring was done in twenty-one cases, pinning or nailing in twenty-eight cases, plating in forty-eight, and fixation by screws in two. A pin and plate were used together in two cases and a ring plate was employed in one.

The fractures included fractures of the lower jaw, clavicle, humerus, olecranon, radius, ulna, metacarpal phalanges, femur, patella, tibia, and metatarsus.

The use of wire in the fixation of fractures has fallen somewhat into disfavor chiefly because for a long time silver wire was employed which was not strong enough to hold the fragments in the fixed position and snapped short at the twist point. The author uses thin brass wire which is stronger than silver wire of the same thickness and resists the action of the tissues for as long as necessary. This wire is sterilized in the usual manner and just before it is introduced is passed through the flame of an alcohol lamp to make it more pliable.

In fractures of the radiohumeral joint it is possible to accomplish all that is desired through the opened joint. The fragments are adjusted, a fine spring pin is introduced, and the wound completely closed without drainage. The limb is then put up in a flexed position in a light plaster cast for two or three weeks.

In fractures of the acromioclavicular joint the fracture area is exposed, the small fragments are fixed temporarily, and a long resection pin is passed through the fragment and into the shaft of the bone through an external puncture wound. The wound is then closed and the arm fixed across the chest in a light plaster cast which is worn for two or three weeks.

In none of the cases of fixation by open operation was there any complication due to sepsis.

S. C. Wolfenberg, M.D.

Edington, G. H.: The Temporary Plating of Fractures of the Long Bones. *Brit. M. J.*, 1922, ii, 1214.

Fractures which most commonly require plating are those of the tibia, femur, and humerus, and less frequently those of the fibula, radius, ulna, and clavicle. In simple fractures it is advisable to operate as soon as possible after the X-ray examination as then the skin will be free from ulceration and the fragments can be adjusted more easily. A Murphy lever may be necessary to reduce the fracture. The ends may be held in position by a Lane forceps or a Lowman clamp. In compound fractures plating should be delayed for a few days in order that asepsis may be assured.

The skin is prepared by an aqueous solution of phenol and the fracture exposed by a straight or curved incision. The straight incision is used when the bone has a good covering of muscle, while the curved incision is more suitable when a plate is used. The periosteum is incised and stripped off the area of bone to which the plate is to be applied. A Lane plate with three or four holes and screws can be used. Splints should be employed for immobilization but care must be taken to place the limb in such a position that function can be restored after the fracture has healed. The plate is removed in three or four weeks, when it has fulfilled its function as an internal splint. As a rule, loosening of the screws indicates that union is taking place. Splints are discarded after six weeks. A plaster cast is applied to the lower limb for four to six weeks. Comminution also may be employed in the treatment of non-union of fractures.

The author draws the following conclusions:

1. Open treatment should not be a routine.
2. Temporary plating is a reliable form of internal splinting in cases of fracture of the tibia, femur, and humerus.

3. The skin incision should not come into contact with the fracture.

4. The periosteum should be stripped where the plate is applied.

5. A flat plate with Lane screws gives satisfactory results.

6. External splints are necessary for support.

7. Plates and screws should be removed in from three to four weeks.

8. Looseness of the screws indicates repair of the fracture.

9. Plating does not prevent delayed union or nonunion.

S. C. WOLDENBERG, M.D.

Campbell, W. C.: The Treatment of Ununited Fractures. *Am. J. Surg.*, 1923, xxxvii, 1.

Campbell reviewed the records of 1,255 cases of fracture treated in his clinic during a period of five years. Sixty-three of these cases were treated by open reduction. This method is employed only when absolutely necessary. It was not used in any of the cases of fracture of the femur.

Campbell concludes that the increase in the number of ununited fractures in recent years is due to a difference in the type of the fractures, improper interpretation of the X-ray plates, too frequent attempts to reduce, and too frequent resort to open operation. However, when there is no sign of the formation of bony callus at the end of six months the fracture should be considered ununited and radical measures should be instituted. The author uses the following technique when open reduction is indicated:

A routine dissection is made to the point of fracture, and the fragments are pared so as to allow perfect coaptation. Great care is taken to preserve as much periosteum on the bone as possible. The attachment of muscle and soft tissues to the periosteum is not severed along the line of the incision. A broad area is exposed for several inches on each fragment, depending upon the size of the bone involved and the location of the fracture. With a sharp chisel, a flat surface is made on both fragments. Scar and osteoid tissue are reamed out of the medulla to healthy marrow, usually from ½ to 1 in. of each fragment. A broad flat graft including periosteum, cortex, and endosteum is taken from the tibia. The width and length of this graft depend on the part involved. With a motor saw the graft is split longitudinally through the edge or small diameter into two parts, a strong outer plate consisting of dense bone of the cortex and an inner plate consisting of a thin portion of the cortex with attached endosteum. The endosteum is removed from the inner half of the graft and a strip placed within the medulla to bridge the fracture as it is reduced. The heavy cortical portion of the graft is held firmly to the bone across the point of fracture. Three or four holes are then drilled through the graft and bone, and nails made from the cortical portion of the inner graft are used. A second graft of small size can be easily secured. Small particles of endosteum are packed about the point of fracture and the tissues are closed tightly in layers.

In some of the cases Campbell cut a slot about ¼ in. wide in both fragments, inserted a massive graft edgeways into this slot, and then brought both fragments together. Autogenous bone nails were placed through the bone and graft. There is some encroachment of the graft on the endosteum but this is not sufficient to prevent satisfactory results. The fragments are stabilized so that no motion can be detected when the operation is completed, but external fixation is always applied.

In order to complete the operation in a reasonable length of time a team of five is necessary, two to prepare the grafts and nails and three to carry out the technique. To prevent delay in union, reduction of the fracture must be accomplished with minimal trauma to the parts and at one attempt. In open reduction of fractures care must be taken not to destroy the natural osteogenetic elements.

S. C. WOLDENBERG, M.D.

Duff, D.: The Treatment of Ununited Fractures by Bridge Grafts. *Brit. M. J.*, 1922, ii, 1215.

Open operations to bridge gaps in bones must be performed with the most scrupulous care as regards asepsis. Ligatures should be handled and tied with forceps, and suturing of the soft parts should be done only with a needle-holder and forceps. At the end of the operation the surgeon's gloves should be free from blood stains as they should not have come into contact with any part of the wound.

Duff has tried out various methods of treating ununited fractures, such as the wedge intramedullary inlay, the combined inlay and intramedullary graft, and comminution of the bone ends. Each of these methods can be used in certain cases, but the most successful results have been obtained with the inlay method or the combined inlay and medullary method. The graft must be long enough to overlap at either end by a wide margin. A graft denuded of periosteum will unite and grow, but it is much safer to use a graft with periosteum.

A wedge-shaped graft is unsatisfactory because it is impossible to obtain sufficient contact between it and the host bone without splinting the host bone for a considerable distance. The inlay graft satisfies the requirements. The intramedullary graft is easy to insert into one end but difficult to insert at the other end. The thrust graft modification of the inlay should be employed only if there is no danger of a flare-up of sepsis. The combined inlay and intramedullary graft is the best, especially when the bone treated requires a thick graft.

Duff uses phospho-bronze wire in suturing. In flail shoulders he applies a double graft between the glenoid and humerus. In gap fractures of the tibia, the sliding inlay and ordinary inlay grafts give good results. In some cases a portion of the fibula may be cut off and placed in the gap of the tibia.

The after-treatment in these cases is important. The limb should be placed in a plaster cast in a

position to prevent strain on the graft, and the next day a window should be cut in the cast over the wound to relieve the pressure. As soon as the wound is healed this window may be filled with plaster. When the plaster is removed the limb should be supported by a light brace and given light massage. When union is delayed without apparent cause, further rest in a plaster cast and massage will sometimes result in firm union.

S. C. Wolfenberg, M.D.

Van Hook, W.: Fracture-Dislocations of the Humeral Head. *Boston M. & S. J.*, 1922, clxxxvii, 960.

Injured joint cavities in which there are bone surfaces not covered by periosteum or cartilage can be successfully treated by the subcutaneous implantation of fat tissue. When such tissue is subjected to recurrent pressure, as in a joint cavity, it becomes thinner, tougher, and more resilient, and loses much of its oil and lymph-space distention. Pedicled flaps are better than free flaps, but the latter soon become vascularized and serve very well. Dead spaces must be avoided and the distance between the joint ends must be decreased as much as possible.

When a small fragment without muscle attachment is dislocated in the shoulder joint at the time of fracture, the difficulty of replacement is great. In most cases of this type the fragment should be excised and a flap of fatty connective-tissue interposed.

Van Hook reports the case of a woman 52 years of age whose shoulder was injured four weeks before she came for treatment. The X-ray showed that a saucer-like piece of bone had been broken from the head of the humerus and lodged below the glenoid cavity. The joint was opened, the detached piece removed, and a large pedunculated flap of fatty-areolar tissue from the adjoining soft parts pushed into the joint cavity and fastened with catgut between the injured humeral head and the glenoid. The arm was then dressed in abduction. The wound healed by primary intention. Massage was given later. After several months, motion at the shoulder joint was almost normal.

Frank G. Murphy, M.D.

Chryssafis, M.: Congenital Bilateral Forward Luxation of the Head of the Radius (Un cas de luxation congénitale bilatérale de la tête du radius en avant). *Rev. d'orthop.*, 1922, xxix, 349.

The case reported by the author was that of a soldier 20 years of age who, when a child, fell on his left hand and several years later fell on the right hand. Since these falls the elbows had been stiff and the arms semiflexed. Roentgenograms showed bilateral congenital forward luxation of head of the radius.

Bilateral luxations of this type were found in twelve of thirty-five cases of congenital luxation of the head of the radius collected by Riss, Kirmisson, and others. The condition is more common in males than in females.

The author's patient believed his malformations were due to his falls and could not be convinced that they were congenital. No other malformation was found in this case. W. A. Bethea.

Knapp, H. B.: Dislocation of the Semilunar Carpal Bone. *J. Am. M. Ass.*, 1922, lxxix, 1992.

The entire surface of the semilunar carpal bone is articular except for slight roughness for the attachment of the dorsal carpal ligament. For this reason, and because of its uneven compression between the lower end of the radius and the os magnum, the semilunar bone may be completely dislocated in sudden forcible hyperextension of the wrist. In such hyperextension the sharp dorsal edge of the distal end of the radius shaves off the dorsal ligament of the semilunar, and the semilunar is then crowded forward out of its resting place, its anterior pole being fixed by the anterior radiocarpal ligament.

Next to fracture of the scaphoid, dislocation of the semilunar bone is the most common injury of the wrist. The fingers are flexed and held rigid because of the pressure of the dislocated semilunar on the flexor tendons and the median nerve, and if the bone exerts marked pressure on the nerve, numbness and tingling result. Pain and swelling are localized anteriorly. An anteroposterior roentgenogram demonstrates the dislocated semilunar much closer to the plate than the other carpal bones, while the lateral view shows it more or less completely rotated forward. The hand appears shortened because the os magnum settles into the space left by the semilunar, while the anteroposterior diameter is increased because of the anterior displacement of the semilunar bone. Occasionally the semilunar bone is palpable beneath the flexor tendons in the anterior wrist region.

Bloodless reduction preceded by the application of moist or dry heat for from three to twenty-four hours should always be attempted first in both early and late cases. Under general anæsthesia pressure should be made on the dislocated bone with the thumb while the wrist is palmar flexed. Extension and counter-extension in the line of flexion will facilitate reduction. Stern advocates the use of the Thomas wrench in bloodless reduction.

If attempts at bloodless reduction fail, open reduction is necessary. Davis' double-curved skid will be found very useful. With the wrist palmar-flexed and with traction on the hand and counter-traction on the arm, this instrument is slipped over the lower pole of the semilunar bone to hook and pry its edge under the os magnum.

The author considers it better to reduce the dislocation rather than to excise the bone, but if the dislocation is associated with fracture of the scaphoid, excision of the semilunar with the proximal fragment or all of the scaphoid gives the best functional result. Rudolph S. Reich, M.D.

Bradford, E. H.: The Treatment of Congenital Dislocation of the Hip. *J. Bone & Joint Surg.*, 1923, xxi, 76.

The end results in nine cases ten to twenty-five years after reduction by the open and the closed methods, are reported. Function was satisfactory in all except two. Both of the latter were cases of bilateral dislocations; in one, reduction was effected by operation, and in the other by manipulation. Several cases seemed to indicate that the anatomical cure is less perfect and motion is more restricted after reduction by incision than after reduction by manipulation. It is probable, however, that in the cases in which operation was necessary the deformity was greater than in the others.

Congenital dislocation of the hip may now be regarded as curable, but forty years ago there was no thorough and satisfactory method of treatment. Abnormalities which must be overcome by the surgeon are: shortened adduction and biceps muscles; contracted ligaments and capsule which act as a sling carrying the body weight from the neck of the femur; alteration in the shape of the acetabulum due to filling in by the adherent capsule; and a flattened and twisted femoral neck. There are three steps in reduction: (1) the stretching or tearing of the resistant soft tissues, (2) the placing of the head opposite the acetabulum, (3) the reduction of the head into the socket through the contracted capsule.

Manipulative reduction can be made easier by mechanical apparatus. In a traction apparatus used in a large number of cases at the Children's Hospital, Boston, a strong rod extends from the perineum to below the foot. Counter-pressure comes on two uprights against the perineum. A V-shaped piece from these uprights extends over the antero-superior spines and when clamped down holds the pelvis firmly. The leg is strongly abducted and stretched, and at the same time a lever with fulcrum on the foundation plate of the apparatus is used to push the trochanter downward and forward. Thus the head is forced through the stretched capsule and into the acetabulum.

The best position will necessarily be with the limb strongly abducted, as the reduced head is then pressed against the bone structure of the socket, while if the limb is adducted, a considerable part of the head lies against the weak cartilaginous rim. As soon as the retaining cartilaginous capsular ring has become sufficiently strong for weight-bearing, the abducted position should be changed and the limb restored to its normal position parallel with the long axis of the body. In the period of cicatrization it is necessary that the great trochanter be kept in the plane of the cross-section of the body rather than behind it, for in the latter position the torn ligaments connecting the ilium and the lesser trochanter become too short on healing and the restoration of the limb to its normal standing position will throw the head out of the socket into the so-called anterior position. Furthermore, the trochanter in the frog position is behind the iliotibial band, and the retaining function of the iliotibial band, pressing on the great trochanter, is not utilized and does not force the head into the socket as it does if the trochanter is in its normal place.

The length of time immobilization and other steps in the after-treatment should be continued cannot be stated definitely but must be left to the judgment of the surgeon in each case. If with active use the hip remains in place for a year the cure is probably permanent. In rare cases, however, there may be a relapse after several years.

Reduction by open incision should be reserved for cases of relaxed or distorted capsule which cannot be reduced by manipulation. Incision means a deep wound followed by dense cicatrization which may interfere with the functional result.

Osteotomy to correct the twisted femur is unjustifiable because the muscles adjust themselves to the new relation and the joint function becomes normal in spite of the twist.

As open operative measures also have their place, the surgeon should be skilled in several methods of reduction and be able to choose intelligently the best method for each case. In the cases of younger children it is sometimes easiest to place the patient face down with the affected leg hanging over the edge of the table. Strong pressure can then be made on the trochanter while the leg is manipulated.

If the deformity is corrected before the child begins to walk an absolute cure can be expected.

WILLIAM A. CLARK, M.D.

Chauvin, E., and Hayem, L.: Two Cases of Limited Fracture of the Acetabular Rim in Luxation of the Hip (Deux cas de fracture limitée du sourcil cotyloïdien au cours d'une luxation de la hanche). *Rev. d'orthop.*, 1922, xxix, 543.

Fractures of the rim of the acetabulum are rightly considered a complication of traumatic fractures of the hip. In 1880 Senn collected twenty-seven cases and showed how the fracture can be produced experimentally in the cadaver. Since then the authors have found only eleven other cases.

In this article two new cases are reported. The first was that of a man 43 years of age who was injured in an automobile accident. Physical and X-ray examination showed a coxofemoral luxation of the iliac type. The roentgenogram revealed also a fracture of the rim of the acetabulum. The detached fragment belonged to the antero-inferior border of the rim and was displaced outward in the space between the neck of the femur and the ilium. Reduction of the luxation was easily effected. Operation to correct the displaced acetabular fragment was believed unnecessary as there was no functional trouble.

The second case was that of a man 56 years of age who was injured in a fall. Examination revealed backward luxation of the hip. The X-ray showed also a fracture of the acetabular rim in the postero-superior portion. Reduction was easily effected, the femoral head resuming its correct position. A later

X-ray examination showed that the acetabular fragments had also become so perfectly replaced that all signs of the fracture had disappeared. This second case followed the classical course, viz., reduction of the fracture following reduction of the luxation.

W. A. BRENNAN.

Bradburn, M.: Fracture of the Femur. *Surg. Clin. N. Am.*, 1922, ii, 1341.

Bradburn gives briefly the essential points in the modern treatment of fractures of the femur and includes in his article pictures of a case in which the result was excellent, if not perfect. He advocates the use of skeletal traction by means of tongs, and states that he has never been unable to secure full length of the femur by this method. He uses the Thomas splint with the knee-flexion attachment, and points out the advisability of moving the knee throughout treatment, this being easily accomplished with the apparatus described. The use of an ambulatory splint is desirable for at least three months after the patient is out of bed. Bradburn has found that skeletal traction is comfortable to the patient, and that the danger of infection about the caliper points is negligible. He reports two cases of compound fracture in which he used Lane's plates combined with Carrel-Dakin treatment; the plates healed in position.

The complete article should be read by those interested in the successful treatment of fractures of the femur in order that it may be studied in conjunction with its excellent illustrations.

DENNIS W. CRILE, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Adams, W. R.: Bone Grafting. *Surg., Gynec. & Obst.*, 1923, xxxvi, 97.

Bone grafting is indicated to repair injured bone, stimulate osteogenesis, replace bone, and close foramina or trephine openings in the skull.

Bone transplantation was first done in 1809 by Merrem. Since that time there have been many studies of bone transplants but surgeons are not yet agreed as to the ultimate function of the graft.

Various grafts are used, viz., the homoplastic, heteroplastic, and autogenous grafts, boiled bone, and ivory pegs. The author regards the autogenous graft as the best.

In using the intramedullary graft Adams makes his incision to one side of the center of the bone. The graft is taken from the fracture. To obtain the exact width of the medullary canal, one end of the exposed fracture is tilted up. The turn saws are then set to this width. The graft is 4 or 5 in. long and does not extend closer than within 2 in. of the fracture. One end of it is pointed and the other blunt. The pointed end is inserted into the bed from which the graft was removed, and pushed into the medullary canal past the line of fracture and into the medullary canal of the opposite end of the fractured bone so that it bridges the fracture.

Since the graft is the exact width of the canal, it holds the fractured ends firmly and in good position.

JOHN MITCHELL, M.D.

Whitman, A.: Observations on the Correction of Deformities of Long Standing. *J. Am. M. Ass.*, 1923, lxxx, 18.

The author reports the case of a man 52 years of age whose legs became completely paralyzed following an attack of anterior poliomyelitis which occurred in his fourteenth year. On the right side there was flexion contraction of the hip at an angle of 130 degrees and flexion contraction of the leg and thigh at an angle of 95 degrees. The foot dangled, but was not deformed. On the left side the flexion contraction was 100 degrees at the hip and 90 degrees at the knee. An astragalectomy was performed in December, 1921, a Soutter operation in January, 1922, and another astragalectomy on the other foot in February of 1922. In March, 1922, a Soutter operation was done on the other side and followed by the application of plaster casts with correction under gas anæsthesia. On May 2, 1922, the patient was able to stand. On May 23, 1922, he took his first step, and on June 1, 1922, he walked with crutches.

The conclusions drawn from this case are as follows:

1. Deformities of indefinite duration may be successfully corrected.

2. Some patients regard independent locomotion worth the risk of repeated operation.

3. No single operation may be relied upon exclusively; combined gradual mechanical and operative correction is necessary.

4. Functional use has a direct influence on the deposit of calcium in bone.

S. C. WOLDENBERG, M.D.

McWilliams, C. A.: The Efficient Treatment of Acute and Chronic, Simple, Traumatic Synovitis (Hæmarthrosis and Hydarthrosis) by Repeated Aspirations and Immediate Active Mobilizations Without Splinting. *Ann. Surg.*, 1922, lxxvi, 677.

McWilliams does not approve of the classical method of treating synovitis of the knee joint by immobilization and its ordinary adjuncts. In its stead, he advises aspiration with a fair-sized needle soon after the injury. When aseptic conditions are assured he has no fear of infecting the knee joint. He advises repetition of the aspiration as often as necessary to keep the joint free from fluid, and reports a very satisfactory case which was cured by the twenty-first day. The method described he regards as the best method of treatment provided there are no joint mice or dislocated cartilages.

The aspiration should be performed immediately, before the ligaments become stretched. It results in a cure in half the time required by the old method.

To leave fluid in a knee joint is just as irrational as to leave fluid in the chest. Aspiration can be performed in the doctor's office and the patient allowed to walk home immediately afterward.

DENNIS W. CRILE, M.D.

Hong, C.: Resection of the Distal End of the Ulna for Shortening of the Radius Following Fracture. *California State J. M.*, 1923, xxi, 1.

Any fracture of the radius which results in shortening of the bones causes certain characteristic changes. The ulna becomes relatively too long and blocks ulnar flexion. Pronation and supination are limited. The hand cannot pull or lift in a straight line with the forearm.

To overcome these difficulties the author resorted to resection of the distal end of the ulna. The only cases suitable for this procedure are those in which there is definite protrusion of the ulna into the wrist joint sufficient to limit ulnar flexion of the hand with or without subluxation of the ulnar head. These are cases of fracture in which the shaft of the radius has been shortened or the epiphysis has been impacted or comminuted.

By the author's technique a linear incision is made over the lateral side of the ulnar head and the head divided at the level of the articular surface of the radius. The triangular cartilage between the radius and the ulna has always been found fractured. The ulnar styloid is seldom fractured. It is important to preserve the radio-ulnar ligaments, but they are usually found ruptured. As a rule neither a splint or a cast is necessary. Physiotherapy, including active and passive motion, is begun as soon as the soft tissues are healed.

Removal of the ulnar head results in partial loss of the bony groove for the flexor carpi ulnaris tendon. If subperiosteal resection is done, the soft tissues maintain the position of the tendon satisfactorily. Every effort should be made to preserve the function of the internal lateral ligament of the wrist.

The author reports four cases and summarizes his article as follows:

1. The operative technique is considerably simplified.
2. Immobilization is rendered unnecessary.
3. Rotation of the forearm and lateral motion of the wrist are more completely restored.
4. There is no possibility of non-union and less opportunity of infection.
5. The restoration of strength and cosmetic results are better.

JOHN MITCHELL, M.D.

Legg, A. T.: Transplantation of the Tensor Fasciæ Femoris in Cases of Weakened Gluteus Medius. *J. Am. M. Ass.*, 1923, lxxx, 242.

The author describes the operation he devised to relieve the limp caused by weakness of the gluteus medius muscle, viz., transplantation of the tensor fasciæ femoris muscle into the outer side of the femur.

He emphasizes the fact that the tensor fasciæ femoris is not only an abductor of the thigh, but a very important flexor. It also holds the center of gravity of the body over the supporting leg when the other leg is raised from the ground. The technique of the operation is as follows:

The incision is begun at the anterior superior spine and extended backward and downward over the great trochanter, and then downward along the course of the femur for about 3 in. The skin with the subcutaneous fat is reflected forward, exposing the fascia lata.

Anteriorly, running downward from the anterior superior spine, the fascia lata becomes thin before it extends over Scarpa's triangle. Along this line the fascia is incised downward from the anterior superior spine to 3 in. below the great trochanter, where it is divided transversely backward for about 1½ in.

At about 1½ in. below the great trochanter the fibers of the tensor fasciæ femoris become inserted into the fascia lata.

The outer surface of the femur is next exposed, about 2½ in. below the trochanter, by dividing the fibers of the vastus externus. A periosteal flap is



Fig. 1. Normal anatomical appearance about the hip. The black line along the tensor fasciæ femoris represents the incision made in freeing this muscle before transplantation.

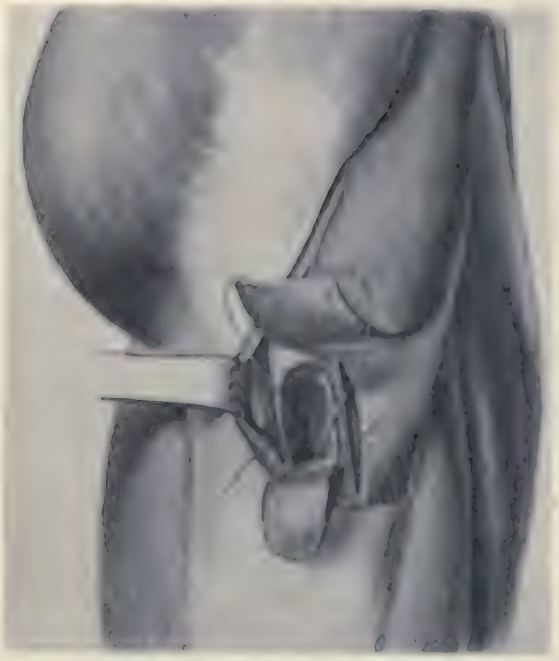


FIG. 1. Groove in femur and freed tensor fasciæ femoris with silk suture before insertion into the femur.

turned downward at this point, and a groove, going into the marrow, is made about 1 in. long and 1½ in. wide.

The free end of the fascia lata is then sutured with No. 18 twisted silk and inserted into the groove by carrying the silk ends through holes drilled in the femur on each side of the groove. The knot is tied over the fascia in the groove, and the periosteal flap is turned back and sutured over the groove containing the fascia.

Before the suturing with silk is completed, the thigh is abducted about 30 degrees, when the fascia is seen to have moderate tension. The skin and subcutaneous fat flap are then turned back and sutured by layers to their original situation.

A plaster spica is applied from the waist to the ankle, with the leg in 30 degrees of abduction.

The postoperative treatment consists of simple superficial massage after two weeks, and muscle training after four weeks. The patient is allowed to go about with the spica and crutches at the end of four weeks.

At the end of two months the spica is removed and an abduction walking splint applied, which the patient wears for six months.

The author has performed this operation about fifteen times with very satisfactory results in most cases. The Trendelenburg sign has disappeared and the lateral swaying of the body has decreased if it has not disappeared. The author states that when the limp is due to weakness of both the gluteus maximus and the gluteus medius muscles, and when limp is due to weakness of the lateral abdominal muscles, transplantation of the tensor fasciæ femoris is not satisfactory. PHILIP LEWIS, M.D.

Mebane, T. S.: The End-Result in Four Cases of Severe Destructive Injury to the Hip. *J. Bone & Joint Surg.*, 1923, xxi, 70.

CASE 1. In this case the upper end of the femur and acetabulum body were shattered and infected October 6, 1918. Healing had occurred by June 29, 1921, after many operations. The patient is now able to walk with a cane. There is good stability but 9 cm. of shortening. There is no pain. Flexion to 140 degrees, extension to 170 degrees, adduction to about 165 degrees, and abduction to 165 degrees are possible.

CASE 2. This was a case of infected compound comminuted fracture of the right hip due to a shell wound. After two years of draining and several operations the patient wore a walking caliper splint for four months and then walked with a cane. The final result was normal passive motion except for loss of abduction, active flexion to 150 degrees, shortening of 6 cm.; dislocated head; and ankylosis of the knee. The patient is able to walk several miles a day without ill effects.

CASE 3. In this case a shell wound of the upper femur and acetabulum required two years and ten months to heal. The patient now has excellent range of motion, good stability, and no pain. He walks with a cane. Shortening amounts to 7.5 cm.

CASE 4. This was a case of loss of the upper end of the left femur, ankylosis of the left knee, and equinovarus deformity of the foot. When the hip healed there was practically normal passive motion, active flexion to 150 degrees, and abduction to 170 degrees. Shortening equalled 10 cm.

These cases demonstrate that a fairly satisfactory result can be obtained in cases of considerable loss of substance and prolonged infection of the hip joint, and suggest that extensive resection of the upper end of the femur in adults is justified for severely infected fractures and perhaps for tuberculosis or septic arthritis. WILLIAM A. CLARK, M.D.

Cotton, F. J.: Knee Lesions and Operations Based on 100 Personal Cases. *Surg. Clin. N. Am.*, 1922, ii, 1021.

Simple synovitis. This condition may result from a blow or twist of the knee with strain or partial tearing of the internal lateral ligament. The author has never seen total tears of the internal lateral ligament alone. Immobilization of the affected knee by plaster of Paris or splints results in an early selective degeneration and atrophy of the rectus portion of the quadriceps muscle and consequent laxity of the joint in addition to synovitis. The treatment suggested is careful massage of the joint and muscle to cause the disappearance of the fluid and maintain the tone of the muscle.

Synovitis with demonstrable lesions. The case cited by the author showed crumpling in of the bone over a very small area of the adductor tubercle. The treatment consisted in immobilizing by splinting and strapping, and massage. After the twelfth day the effusion had almost entirely disappeared and the condition of the knee was very much improved. The patient is now able to walk with crutches.

Chronic or subchronic synovitis. This is usually due to neglected synovitis in which too long immobilization and lack of massage and muscle exercise have produced a loose joint. The treatment consists of massage, active exercise of the quadriceps, the use of a Thomas heel, and strapping. The prognosis is usually good, but a cure may not be effected until after several months. For cases which do not respond to this form of treatment, the author suggests a stoma draining into the intermuscular spaces of the thigh.

Chronic luetic synovitis. This condition, which is very rare, is a chronic symmetrical synovitis due to adolescent hereditary syphilis. A case reported showed marked effusion, slight capsular thickening, and limitation of motion due to fluid. There was no local heat, tenderness, or pain. The X-ray examination was negative. Very marked improvement followed arsphenamin treatment.

Arthritis with effusion. Cases of arthritis with effusion are often mistaken for cases of synovitis. They may be of the active infectious or mild, recurrent chronic type. Very careful massage, heat, and motion are usually beneficial. In the more severe cases traction with a Thomas splint or caliper should be continued for months.

Mild, dry arthritis. In this condition there is usually no effusion in the knee. Strain is due to overweight with or without knock-knee or arthritis, but usually with pronation of the feet. Relief is given by the Thomas heel, adhesive strapping, and a supporting bandage on the knee. Reduction of about 20 lbs. in weight ensures permanence of the cure.

Adhesions within the joint. These are usually due to a fracture into or adjacent to the knee joint, or are the result of arthritis. In some cases the breaking up of adhesions by manipulation under anæsthesia followed by massage is sufficient, but in more severe cases an open operation to free an adherent patella is necessary. Occasionally arthroplasty is indicated.

Adhesions outside of the knee joint. Such adhesions are usually due to fractures of the femur. *Brisement forcé* has not been satisfactory. The best treatment is early active assisted motion and massage.

Simple cartilage dislocation. A sign of simple cartilage dislocation is locking of the knee joint 20 degrees short of full extension, with severe pain when extension beyond this point is attempted. Another sign is palpable cartilage on the outside of the knee level of the joint or a point of definite tenderness just in front of the midjoint line on the inner side. Cases in which locking has occurred only once should be treated conservatively. The cartilages should be removed only when they become dislocated frequently.

Fringe pinching. This condition may be confused with locking due to dislocated cartilage. Operation is indicated in both conditions only if the cartilage is doubtful. The fringe of the ligamentum alaria should be inspected and removed also if necessary.

Cartilages with secondary joint changes. The patient whose case is cited gave a history of injury to the knee joint and could bear no weight on the knee without a caliper splint. Flexion to 15 degrees was possible without pain; total flexion was 50 degrees. The joint was tender on palpation and showed abnormal lateral mobility. Large fat pads and both semilunar cartilages were removed. In some cases a splint is worn to maintain the stability of the joint. The operation is generally beneficial.

Villous arthritis. In this condition there is a general thickening of the postpatellar pads with overgrowth of the subsynovial fat tissues. The condition may be due to hypertrophic arthritis, synovial tuberculosis, osteochondritis, or repeated trauma. Loose cartilages are removed together with villous hypertrophic growths including masses of the ligamentum alaria. The operation results in considerable improvement.

Osteochondritis dissecans. This condition is usu ally the result of a dissecting process in the cartilage of the femoral notch which gives rise to free bodies in the knee joint causing arthritic changes. Operative removal gives good results.

Free bodies or joint mice. The author ascribes joint mice to the loosening and growth of fragments of chipped bone within the joint due to broken osteophytes or osteochondritis. There is a history of locking and synovitis. Operative removal usually results in cure.

Contractures. Joint contractures are usually due to contracture of muscle or scar tissue outside the joint, the result of fracture or trauma near the joint, arthritis, etc. In some cases the treatment consists in tenotomy of the involved tendons, correction by means of gradual extension with a Thomas splint, physiotherapy, etc.

Ruptured ligaments with and without dislocation. If luxation is present it is easily reduced if no arteries are torn. Rarely, all the ligaments are ripped loose. The most important structures are the posterior crucial ligament and the internal lateral ligament. If there is greater involvement, operation is indicated, although most of the methods give only fair results. The author's best results were obtained by reconstructing the lateral ligaments from fascia lata at such a slant as to limit the luxation without interfering with normal motion.

Chronic patellar luxation. The patella is luxated outward by flexion either permanently or recurrently. The condition is said to be due to malformation of

the femoral condyles or to knock-knee. In the author's operation a long lateral incision is made in and outside of the patella, and another in the ligamentous capsule of the outer side of the patella. A similar but shorter incision is made on the inside. The patellar tendon is split in half and the distal end separated and passed under the intact half and sutured into the lower end of the inner cut of the capsule. The rest of this cut is overlapped ¾ in. and sutured. Good results were obtained in the case cited.

Patellar fracture. Fracture of the patella is usually caused by direct violence. The treatment consists in open operation, suturing through the solid tendon at the side of the patella and the lateral tears and torn tissues in front. Two sutures are placed in front of the torn bursa to avoid skin adhesions. Motion is begun after immobilization by strapping for three weeks. The results are satisfactory.

Ruptured quadriceps tendon. This is more common in older persons and in males. It is mechanically equivalent to fracture of the patella. Operation consists of suturing the tendon with kangaroo tendon after freshening the surfaces. Mobilization for three weeks should be followed by massage and active motion. After six weeks the patient can get up.

Rupture of the patellar ligament. This is a very rare condition which is equivalent to fracture of the patella. Suturing is indicated. Convalescence is somewhat longer than in cases of fracture but the same functional results are obtained.

Avulsion of the tibial tubercle. Usually the tip of the long epiphyseal tongue which runs down the patellar tubercle is torn away. The condition occurs usually in boys between 10 and 18 years of age. It is considered similar to Osgood-Schlatter disease.

Non-tuberculous arthritis: destructive excision. There is usually roughening of the cartilage with the presence of synovial villi. Plastic excision resulting in ankylosis gives good function.

Tuberculous arthritis: excision. Radical incision for this condition usually results in ankylosis of the affected joint and healing of the process.

Joint trauma and deformity: excision. Excision is advised for cases of old fractures in which conservative treatment has been of no avail. A good functional result is obtained after ankylosis.

In certain new severe condylar fractures the author has obtained good function by remodeling the condyles to a smooth surface and removing spurs.

Old injuries: plastic remodeling. Two cases are cited in which malunion of the condyles of the femur resulted in limitation of extension of the leg. The projecting portion of the femur was removed and the curve of the joint surface reconstructed sufficiently to permit complete extension.

Arthroplasty. The results of arthroplasty on the knee thus far have been poor. The results of Putti's operation have been more satisfactory.

Osteotomy for deformity. Deformity of the knee joint such as knock-knee is due to irregular epiphyseal growth following infection, fracture, etc. Subcutaneous osteotomy is performed at the point of maximum deformity, immediately above the femoral condyles or below the tuberosities of the tibia. The deformity is corrected and the limb immobilized in a cast for six or seven weeks.

Septic bursa. This condition is due to infection following trauma. Operation consists of free excision and drainage.

Septic joints. The treatment consists in opening the joint and irrigating with corrosive salt solution 1:15,000 for fifteen minutes, the joint then being closed. This is usually sufficient unless there is involvement of the adjacent structures.

Charcot joints. This condition usually occurs very early in locomotor ataxia. The author has seen improvement following intensive antisyphilis treatment. The knee joint should be supported by a caliper splint. RUDOLPH S. REICH, M.D.

Cook, A. G., Stern, W. G., and Ryerson, E. W.: Report of the Commission Appointed by the American Orthopedic Association for the Study of Stabilizing Operations on the Foot. *J. Bone & Joint Surg.*, 1923, xxi, 135.

The Commission found that a foot ankylosed in moderate calcaneus results in heel walking with a slight limp and gives a fairly serviceable foot. A moderate equinus is much better as with this condition the patient walks on both the heel and the sole, limping is absent or slight, and the raising of the heel lengthens a shortened leg.

The transverse horizontal section of Davis, the open arthrodesis of Hibbs and others, and the Whitman astragalectomy result in a new and simplified ankle joint, the motions of which are controlled by bone balance independent of muscle action. The first two operations cause ankylosis of the tarsal bone and displacement of the foot backward on what is left of the astragalus, the foot being placed in moderate equinus. The Commission prefers: (1) the astragalectomy of Whitman, (2) the open operation of Hibbs, and (3) the transverse horizontal section of Davis.

Persons with paralytic talipes calcaneus, talipes calcaneocavus, and flail or dangle foot, with or without varus or valgus, are suitable subjects for astragalectomy and transverse horizontal section. These operations are not indicated when the calf muscles are active.

In cases in which there is a rigid heel cord, the astragalus and os calcis are in a comparatively normal position, and the entire drop is confined to the anterior position of the foot, a large wedge of bone is removed from the head of the astragalus and the posterior articulating surface of the scaphoid. Ankylosis results in a stable foot which is a little shortened but has good lateral and ankle motion.

The deformities commonly found in varus or valgus may be corrected by removing the superfluous

portions of bone when arthrodesis is effected in the various joints of the tarsus separately. In order to maintain muscle balance the necessary tenotomies and tendon transplantations can be done at the time the bone balance is corrected. Of the 250 feet examined by the Commission last year, a great majority had been subjected to tenotomies and tendon transplantations, but all had a stabilizing operation ultimately. This finding might suggest that a stabilizing operation should be done in the first place, but it must be borne in mind that only cases in which tendon transplantation failed were examined.

The Commission considered also the various methods of treating partial and total paralysis of the dorsiflexors of the foot.

1. Arthrodesis of the ankle joint by excision or by graft. This procedure usually fails to cause ankylosis if it is performed before the age of 14 years. The external malleolus should be fractured and displaced inward to bring the three bones into close approximation. Most patients were dissatisfied with the result, chiefly because of the increased strain thrown upon the mediotarsal joint and because they experienced difficulty in walking up and down hill and putting on and removing their shoes. The latter difficulty was easily remedied by the wearing of shoes laced down to the toes. Lexer's method of driving an autogenous or heterogeneous peg up through the os calcis and astragalus into the tibia fails because the intra-articular portion of the peg usually becomes absorbed within a year.

2. Silk ligament suspension from the tarsus to the tibia. This method is not recommended for young children as the silk may cut through the bones of the tarsus and the unyielding cords cause severe distortion and disability with the growth of the foot and leg. Good results were obtained in some cases operated upon in early adult life, but in others either varus or valgus occurred. In a few cases the silk caused suppuration for a long time after the operation. Therefore the use of silk ligament should be restricted to carefully selected cases of patients over 15 years of age.

3. Tenodesis by the method of Putti, Gallie, or Codivilla. This procedure may be used on children under 15 years of age. In some cases good results have been obtained, but there is considerable doubt as to whether the weak, paralyzed tendons can hold up a drop-foot throughout life. The Commission reserves its decision regarding the method until a greater number of late results have been studied.

4. Suspension of the foot by strips of fascia lata or the fascia of the leg. In the few cases studied by the Commission the results have not been sufficiently convincing to warrant recommendation of this procedure.

5. Excision of diamond-shaped pieces of skin or a skin-bone flap in the dorsum of the ankle joint. Only temporary benefit results.

6. Astragalectomy. This operation has a distinctly beneficial effect in drop-foot and especially in flail-foot, the results being sufficiently good to warrant its use in selected cases. None of the operative methods considered can be confidently recommended as a standard procedure. Lateral deformities of paralytic feet are far more disabling and more frequently require correction than simple drop-foot.

7. The use of drop-foot braces, such as elastic straps fastened to the shoe, spring-wire supports with a coil at the sides of the heel, and the flat spring extending along the sole and up the back of the leg. These are all useful and comfortable.

The Commission urges that tendon transplantation be almost always supplemented by stabilization of a sufficient number of the smaller joints of the foot to prevent or correct all tendency to varus or valgus deformity, such deformities being of much greater importance than drop-foot.

RUDOLPH S. REICH, M.D.

SURGERY OF THE SPINAL COLUMN AND CORD

Gruget: Lateral Subluxation of the Third Cervical Vertebra on the Fourth (Subluxation latérale de la troisième vertèbre cervicale sur la quatrième). *Arch. franco-belges de chir.*, 1922, xxv, 939.

It is believed by many that incomplete luxation of the cervical vertebræ is an anatomical impossibility. Gruget, however, has treated such a condition in a man 20 years of age, the result of a fall.

The signs observed about a week later were: (1) inclination of the head to the left and slight right rotation resembling torticollis; (2) elevation of the left and depression of the right shoulder; (3) marked curvature of the spinal column, the convexity being on the left side in the region of the lower dorsal vertebræ.

Lateral displacement of the third vertebra on the fourth cervical was clearly indicated in an anteroposterior roentgenogram, the interarticular line appearing oblique from above downward and from right to left. This was a case of the "incomplete luxation" described by Cyriax, and the "minor displacement" described by English writers.

Continuous extension for several days was followed by cervical extension and traction with the head of the bed raised. After the fourth day the patient was laid flat in bed and manual reduction was attempted. This was successful. The patient was then kept in extension for forty-eight hours. When he was examined three months later his condition was normal.

W. A. BRENNAN.

Langnecker, H. L.: The Treatment of Painful Affections Involving the Cervical Vertebræ. *California State J. M.*, 1923, xxi, 31.

The author classifies cases of painful affections involving the cervical vertebræ into three groups.

The first group includes the most severe injuries and inflammations, such as fractures, dislocations, bone tuberculosis, and syphilis. Immobilization is the treatment indicated.

Group 2 includes the cases of arthritis. In these, a search for local infections should be made.

Group 3 includes the obscure cases, in which the cause is unknown.

After the diagnosis has been made, adequate treatment should be given to restore maximum function. Rest is essential. Improvement of the tone of muscular and ligamentary tissue is hastened by local hyperæmia. Movement should be attempted early. The treatment should be completed by training in carefully selected active exercises. Too often fixation alone is carried out, and no attempt at restoration of function is planned.

JOHN MITCHELL, M.D.

Vanderput, E.: A Case of Luxation-Fracture of the Cervical Spine (À propos d'un cas de luxation-fracture du rachis cervical). *Arch. franco-belges de chir.*, 1922, xxv, 942.

The author reports the case of a man who sustained a cervical luxation-fracture in a diving accident and died four days later. The accident was followed by immediate quadriplegia. The paralysis of the arms was of the radicular type. Sensation remained normal in the head and in the first four segments of the cord but was decreased in the fifth segment and lost below the sixth. Other sequelæ of the injury were total abolition of the tendon, osseous, and cutaneous reflexes, retention of urine and fæces, and priapism. Meningeal puncture showed bloody fluid. The clinical picture was that of a quadriplegia due to an indirect injury to the cord involving especially the sixth segment. The X-ray showed a fracture of the fifth cervical vertebra. The rapid evolution of the clinical phenomena indicated that operation would be useless. At autopsy the fifth vertebral body was found detached in front and luxated backward.

In cases of injury of the cervical cord such as this the probability that the patient will survive is so slight that surgery is not justified. In injuries of the dorsal and lumbar spine, early operation may be advisable as there is some chance of obtaining a condition of medullary automatism. Whatever the site of the injury, a simple decompression may be done if the general condition permits it and infection can be prevented. W. A. BRENNAN.

Girdlestone, G. R.: The Place of Operations for Spinal Fixation in the Treatment of Pott's Disease. *Brit. J. Surg.*, 1923, x, 372.

Girdlestone reports fifty cases of operative spinal fixation in Pott's disease which, combined with the fifty cases he had previously reported, gives authority to his conclusions. He emphasizes the fact that the operative fixation of the spine is only part of the conservative treatment of Pott's disease, and suggests that many of the criticisms brought against operative fixation are due to the fact that cases have been treated by operation without proper splintage, without open-air methods, and without adequate rest or sufficient time.

He divides the angular kyphoses into two elements: (1) the telescoping and crowding together of the dorsal process, corresponding to the amount of destruction of the bodies, and (2) the inflection or falling forward of the segment above until it regains support from the solid vertebræ below. He points out that spinal fixation is always posterior and does not replace the bodies of the vertebræ which have been lost from the effects of the disease. The only function of internal fixation is that of splinting the diseased area until rest and time can heal the disease in the bodies by cicatrization.

Girdlestone discusses the different methods described and advocated by Calot, Hibbs, Albee, De Quervain, Ombredanne, Toblasec, Gallie and Robertson, Hey-Groves, Hoessly and Calvé, mentioning in particular the fact that De Quervain and Hoessly found that after healing had occurred, grafts placed in the spines of a dog's vertebræ from which one of the bodies had been excised supported a weight of 40 kgm. applied to the centrum above the defect.

In ninety-five of one hundred cases Girdlestone used Albee's method of applying a graft from the tibia to the split spines or to the bared laminæ. He prefers the former. In five cases he employed osteoplastic methods. He used a mechanical or motor saw to cut the bones. Two patients died within a week. Six died later, one from continued caries and five from general tuberculosis or some other condition.

Ninety-four of the cases were clean cases but six of them presented discharging sinuses. Girdlestone lays great stress upon the fact that internal fixation must not be depended upon for fixation until at least three, and preferably six, months after the operation. He credits his gratifying results to the use of what he calls a "turning case," a molded plaster cast of the anterior half of the body made for the particular patient before operation and applied whenever the patient is turned from his back. The operation is done with the patient lying prone in this turning case so that no stress is placed upon the graft until it has healed completely.

The author concludes that operations for spinal fixation are in no sense radical. "External splintage of the spine must be maintained continuously before operation, during the operation, and afterward until firm stability of the affected section is assured by the restoration to stability of the bones and ligaments of the part, coupled with the stronghold of the graft or osteoplastic union." In Girdlestone's hands the operation has been free from danger in the cases of adults and has given good structural stability, but in some of the cases of children the graft has been absorbed and in certain others death has occurred. Therefore he concludes that in adults posterior spinal fixation is reliable and has

great value, but in children it is less reliable and at the same time less needed and therefore seldom, if ever, indicated. DENNIS W. CRILE, M.D.

Calvé, J., and Galland, M.: Osteosynthesis in Pott's Disease (Quelques considérations sur l'ostéosynthèse dans le mal de Pott.) *J. de chir.*, 1922, xx, 573.

The authors discuss the indications and contra-indications for the treatment of Pott's disease by the use of bone transplants.

Operative interference is never indicated in tuberculous disease of the spine in children because the classical treatment gives excellent anatomical and orthopedic results. Further, the operative treatment does not permit the patient to be up and about and the bone graft opposes a solid anatomical union of bone and the establishment of therapeutic corrective lordosis.

In adults, operation should be restricted to those cases in which the tuberculous process has been arrested. In short, for patients not of the laboring class the classical methods of treatment are best. For those of the poorer classes bone transplants may be used in order that the patient may more safely carry on his occupation without recurrence.

LOYAL E. DAVIS, M.D.

Wheeler, W. I. C.: Operation as Part of the Conservative Treatment of Pott's Caries. *Practitioner*, 1922, cix, 341.

From an operative experience of twenty-four cases the author concludes that the bone-graft operation to cause ankylosis in a tuberculous spine is a valuable aid in the cases of adults but unnecessary, if not contra-indicated, in children. In the cases of adults early operation is advisable unless the patient can give two years to absolute rest and can obtain the best orthopedic care and nursing.

The kyphosis cannot be materially reduced by operation but an acute angle may be rounded by cutting off some of the prominent spinous processes. Correction by pressure may be tried but the use of much force is dangerous.

Abscess is not a contra-indication. In fact, one of the most surprising and gratifying features in the treatment of spinal caries is the rapid disappearance of abscesses after fixation of the diseased segment by a bone graft. Paralysis also rapidly disappears in many cases after the operation, and is regarded as a strong indication for surgical treatment unless there is early response to conservative treatment.

Experience has shown that sepsis is not much to be feared. When it does occur, the graft seems to live through it and ankylosis occurs just the same.

Bone grafting in the spine shows a higher percentage of successful results than similar operations on the long bones. This is probably because the site of the graft in the spine is well removed from the diseased portion. It is thought that the grafts are not absorbed and replaced. They become less dense for a while, but roentgenograms made about six months later show them to be more dense than before.

In the cases reviewed the Hibbs operation was done only once. In the others a modified Albee technique was used. Rib grafts were employed in two cases and tibial grafts in the others. Instead of splitting the spinous processes to make the bed for the graft, the sides of the processes were denuded of periosteum and the bone surface gouged with a file. The graft was then laid against this raw surface and the soft tissues were sutured over it.

The after-treatment consisted in support on a frame in bed for three months, then limited freedom with a spinal brace, and gradually increased activity. Most of the patients were able to go back to work at the end of a year. WILLIAM A. CLARK, M.D.

Wallace, J. O.: Crush Fractures of the Spine. *J. Bone & Joint Surg.*, 1923, xxi, 28.

This article is a detailed statistical study of eighty-two cases of crush fracture of the spine.

Fractures in which hyperflexion or hyperextension of the spine was the causative factor, as in a fall from a height, diving accidents, or the falling of a weight on the back, are located in regions where the fixed portion of the spine meets a movable portion. Sixty-four per cent of all fractures occur in the first and second lumbar vertebræ and 32 per cent in the other lumbar vertebræ.

The author found that in the absence of an evident paralysis the diagnosis of fracture was not often made previous to admission to the hospital. In the forty-seven cases in which the correct diagnosis was not made, paralysis was present in only one, while of the twenty cases in which the diagnosis was correct 75 per cent showed paralysis.

The complaint of 85 per cent of the patients was pain at the level of the fracture. Pain on deep pressure over the knuckle in the spine is a fairly constant sign. Deformity is invariably present at this site unless the fifth lumbar is the vertebra involved, when increased lordosis is present. Limitation of motion is present in every case, and in a vast majority limitation of hyperextension is by far the most valuable sign of fracture.

In examining a fractured spine, especially in late cases, a point at which the upper and lower fragments pivot will be found when the patient bends laterally. This is at the site of the fracture and will be a point around the knuckle in the spine.

In the treatment the lower fragment, i.e., the vertebra below the fractured vertebra, is fixed by fastening the lower extremities in a spring frame resting on the side bars of the hospital bed and superimposed over its lower two-thirds. When the frame is adjusted so that it extends to the level of the fractured vertebra, supporting the entire lower fragment, it is raised by means of a screw and the upper fragment is allowed to bend posteriorly to the bed.

When correction has been continued on this bed as long as necessary a new type of body cast is applied.

This cast is applied on a horizontal frame with a bar pressing forward on the deformity protected by a thick pad of saddler's felt, while the upper fragment, i.e., the dorsal spine, is held horizontal and the lower fragment is thrown forward as much as the angle of the deformity. The weight of the patient's body then tends to throw the lower fragment backward into an oblong window which is cut on the dorsum of the cast with its upper edge at the apex of the deformity.

This cast is worn from six to twelve months, depending upon the patient's age and the duration of the deformity. Internal bony fixation is unnecessary. DAVID R. TELSON, M.D.

SURGERY OF THE NERVOUS SYSTEM

Abrahamsen, H.: Injuries of the Nerves of the Arm (Ueber Schaedigung der Armnerven). *Ugesk. f. Laeger*, 1922, lxxxiv, 295.

The author differentiates between primary and secondary lesions of the nerves, the former due to fractures and other injuries and the latter to pressure from callus formations, aneurisms, etc. Twenty-five per cent of all nerve injuries in the arm are lesions of the radial nerve. The median and ulnar nerves are involved in only 12 and 8 per cent respectively. Secondary lesions are more common in children than in adults, especially in fractures of the diaphysis and near the elbow. The median and ulnar nerves are less exposed to injuries from fracture. Nerve lesions occur frequently also in dislocation of the humerus and elbow. Among the laboring classes the open primary lesions due to puncture injuries are the most common, whereas in children a greater number of subcutaneous lesions are observed.

In the author's opinion every incisional wound should be examined under anæsthesia if an injury of the nerve is suspected.

Three cases are reported. SPITZY (Z).

Leriche, R.: The Indications for Posterior Radicotomy Based on Twenty-Five Cases (Des indications de la radicotomie postérieure, à propos de vingt-cinq observations). *Lyon chir.*, 1922, xix, 647.

Seventeen of the twenty-five cases discussed in this article were first reported in 1914. In these seventeen cases there were four deaths. Three of the deaths Leriche believes could have been prevented by better technique. All of the other patients operated upon recovered with only very few and slight postoperative complications.

Intradural radicotomy in one stage is not a hazardous or difficult operation, but takes much time. In Leriche's twenty-five cases it was performed for the following indications: crises of tabes, seven; radiculitis, two; pachymeningitis, one; pain due to neoplastic compression, three; painful stumps, two; rebellious zona, one; Parkinson's disease, three; sclerosis *en plaque*, one; and spasmodic paralysis, five.

Four of the operations were cervical radicotomies, nine were dorsal, five were lumbar, and seven along the terminal cone. Twenty-one of the operations were intradural and four were extradural.

Leriche did not observe the definite disappearance of tabetic crises in any of his seven cases of tabes in which radicotomy was done. Neither did he find the operation always beneficial in cases of radiculitis. Rebellious zona seems a good indication for posterior radicotomy. In cases of painful stump Leriche has had one good result and one failure. For this condition he believes radicotomy should be the last resort, chordotomy being preferable.

In cases of neuralgia due to neoplastic compression radicotomy sometimes gives excellent results, and at other times only temporary benefit. It is indicated when the pains are clearly localized; but in cases of poorly localized pains it is less efficacious.

In spasmodic paralyses, and especially in Little's disease, section of the roots should not be done if there is any cerebral taint or the spasmodic phenomena are evidenced particularly in the upper limbs. In the less severe cases great improvement can be obtained if the operation is performed at the age of 13 or 14 years.

The results of the operation are particularly interesting in the spasmodic paralysis following certain types of meningitis.

In conclusion Leriche states that there need be no fear as to the solidity of the laminectomized spinal column. W. A. BRENNAN.

Jianu, J.: Contributions to the Surgery of the Sympathetic Nervous System (Beitraege zur Sympathicuschirurgie). *Spitalul*, 1921, th. 312.

In three cases of dry gangrene of the leg Jianu resected from 15 cm. to 20 cm. of the plexus perifemoralis, from Hunter's canal upward to Scarpa's triangle, and even the plexus femoralis profundus. Because of the resultant paralytic vasodilatation much more of the leg was saved than is usually possible. There was no recurrence.

In two cases of gastric crises in tabes Jianu extirpated the splanchnic nerves and the semilunar ganglion according to the method worked out by Gomoin. After laparotomy and division of the gastrohepatic ligament, the liver (the spigelian lobule) and the lesser curvature were drawn well upward and down, to expose the inferior vena cava and, on the left side under the peritoneum, the great splanchnic nerve. The latter was then followed upward to the diaphragm and extirpated with Lobstein's ganglion by means of a pincette. Lateral to it and behind the cava is found the lesser splanchnic nerve. This was treated in the same manner. Below, these two nerves lead to the right semilunar ganglion. This ganglion was extirpated

and the efferent fibers of the solar plexus and the pneumogastric nerve were divided.

In a case of glaucoma and trigeminal neuralgia Jianu performed a unilateral cervicothoracic sympathectomy by Jonnesco's method with excellent results. STOIANOFF (Z.)

Kleinschmidt, O.: Sciatic Phlebalgia and Sciatica (Ueber Phlebalgia ischiadica und Ischias). *Klin. Wchnschr.*, 1922, i, 1750.

According to Reinhardt, sciatic phlebalgia may be caused by varices within or on the surface of the nerve, and involving its entire course or only a certain section.

The clinical symptoms are gradually developing pain in the foot and calf, fatigue, and cramps, which disappear at night and when the leg is elevated. In contrast to this, the pain of sciatica is severe, appears suddenly first in the gluteal region, and is aggravated (Lassègue) rather than decreased when the leg is elevated; in addition, there are neuritic symptoms (sensory disturbances, atrophy, and pressure points). Similar symptoms may be produced by secondary changes in the blood vessels along the sciatic nerve due to thrombosis, phlebitis, and advancing sclerosis.

The author reports two cases of the latter type. In one, the sciatic nerve was enclosed in an indurated sheath penetrated by thrombosed vessels, while in the other there were varices around the tibial and peroneal nerves which became inflamed and caused severe neuritic symptoms in the region of these nerves. Both patients were cured by operation.

KIESS (Z.)

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Krainz, W.: A Case of Papillomatosis of an Abscess Cavity (Ueber einen Fall von Papillomatosis einer Abscesshoehle). *Frankfurt. Ztschr. f. Path.*, 1922, xxviii, 592.

This article is a detailed histologic description of a papillary tumor the size of a fist, which developed during the course of twenty years in an abscess cavity of the buttock in a 40-year-old woman and was removed at operation. Especially worthy of notice was the markedly atypical development of epithelium upon the papillæ, which was traced by the author to the ingrowth of the epithelium of the skin into the abscess cavity. The most important factor in the development of the papillæ was the epithelium.

Healing took place by first intention, without recurrence or the formation of metastases, according to later reports from the attending physician.

MEYER (Z).

Wassmer, E.: The Elective Fixation of Radium-Colloidal Substances on Embryonic and Neoplastic Cells and Its Importance in the Diagnosis and Treatment of Cancer (La fixation élective des substances radiumcolloïdales sur les cellules embryonnaires et néoplasiques; son importance dans le diagnostic et le traitement du cancer). *Bull. Acad. de méd.*, Par., 1922, lxxxviii, 146.

Wassmer, the director of the Swiss Radium Institute at Geneva, reports a new method for the diagnosis and treatment of cancer which consists in the elective physicochemical fixation of radium-colloidal substances on embryonic cells in general and especially neoplastic cells.

Experiments carried out for some time showed that, when introduced into the circulation of pregnant guinea pigs, the atomic corpuscles of radium-colloidal substances become electively fixed on the embryo. The fixation was demonstrated by a curiegraphic picture of the embryo. The author verified this elective fixation in clinical cases of primary tumors and metastases by injecting radium-colloidal substances both intravenously and directly into the tumors and then examining the curiegraphic images of the tumors.

A case reported was that of a woman with an endothelioma of the left parotid region with metastasis in the pre-auricular glands. Intravenous injections followed by local injection into the glands enabled the author to obtain a curiegraphic picture of the primary tumor and a second picture showing a metastasis at the base of the brain. Further injections were followed by a decrease in the size of the tumor and total clinical disappearance of the metastasis.

Wassmer states that the method of injecting radium-colloidal substances is entirely new. Because of the affinity of the atomic and colloidal particles for embryonic and neoplastic cells it makes possible a further study of the biological chemistry of young and neoplastic protoplasm. It is a curiegraphic method which permits early diagnosis of deep neoplasms and their metastases. Because of the physicochemical fixation of the radium-colloidal particles on neoplasms and their metastases, it brings the curative agent into the very center of the neoplastic and embryonic cells.

For these reasons the author believes the method opens up a new and very fertile field in the treatment of cancer.

The patient whose case is reported ultimately died of cerebral hæmorrhage. Wassmer was able to confirm the complete disappearance of the tumor in the parotid region and of the metastases in the neck, but he believes it is possible that the treatment by six intravenous and three local injections of radium-colloid may have favored the rupture of the cerebral artery which caused death.

W. A. BRENNAN

Bullock, F. D., and Curtis, M. R.: A Transplantable Metastasizing Chondro-Rhabdo-Myo-Sarcoma of the Rat. *J. Cancer Research*, 1922, vii, 195.

With the exception of certain mixed tumors of the testis, ovary, and kidney, neoplasms containing striated muscle are very uncommon in man, and only a few have been found in animals. The rat tumor herein reported is apparently the first rhabdomyoma in a rodent to be recorded.

The growth was found in a black and white female rat between 15 and 19 months old, one of a group which had been experimentally infested with cysticercus fasciolaris. When first observed, the tumor was about the size of a pea. In the first few weeks it showed practically no increase in size, but at the end of two months, when the animal was mated, it was slightly larger. The rat later gave birth to two young, only one of which she reared. During gestation the tumor grew rapidly.

One month after gestation a fragment of tumor was removed surgically and used for the subcutaneous inoculation of ninety-three rats. The rat survived the operation thirty days, during which period the tumor grew rapidly. Microscopically the growth showed a rather complex structure varying in different parts. It was composed partly of muscle cells and fibers and partly of small round or polyhedral cells, suggesting embryonic cartilage cells. These two types of cells occurred separately in certain parts of the tumor, but in general were freely intermixed, one or the other predominating.

Scattered through the tumor were large and small islands of cartilage. The central parts of some of these islands consisted of differentiated cartilage cells, while the cells comprising other islands were solely embryonic in type. The cartilaginous islands showed a marked tendency toward necrosis. Embedded in the tumor were several small trabeculæ of osteoid tissue. The tumor was rich in blood vessels consisting largely of dilated capillaries.

Transplantation of the tumor was successful and is now in the eighteenth generation. In its initial difficulty of propagation this tumor resembled a carcinoma rather than a sarcoma. Of the grafts introduced subcutaneously into the ninety-three rats of the first generation only three produced tumors, and only five tumors were obtained from the forty-eight rats of the second generation. In the third generation, however, the inoculation was successful in 80 per cent of the cases, and in the subsequent generations there was a moderate to high percentage of takes.

Unlike most other rat sarcomata, this tumor on transplantation grew progressively in almost every animal in which a graft became established.

In conclusion the author describes the tumor briefly as a chondro-rhabdo-myo-sarcoma of the sternum, a transplantable metastasizing tumor in which cross-striated muscle fibers have persisted through fifteen generations although the cartilaginous elements early lost their power of differentiation.

GEORGE E. BEILBY, M.D.

BLOOD

Loehr, W., and Loehr, H.: The Changes in the Physicochemical Structure of the Blood Plasma with Accelerated Sedimentation of the Blood Cells Following Treatment with Irritants, Surgical Operations, and Diseases (Ueber die Veränderung der physikalisch-chemischen Struktur der Blutflüssigkeit bei beschleunigter Blutkörperchensenkung im Gefolge von Reizkörpertherapie, chirurgischen Operationen und Erkrankungen.) *Ztschr. f. d. ges. exper. Med.*, 1922, xxix, 139.

In this study the authors attempted to determine the physicochemical changes produced in the blood plasma by injections of protein, infections, surgical diseases, and aseptic operations. For this purpose they did not use the plasma flocculation reactions of Sachs and von Oettingen, but employed the viscosity, refraction, and surface tension. In all of the experiments the determinations were made on plasma entirely free from hæmoglobin to which hirudin or citrate had been added. In the use of the Ostwald viscosimeter, the influence of temperature was eliminated by means of a thermostat kept constantly at 20 degrees C. Hirudin was used only for the determination of fibrinogen and for particularly important cases. For other determinations 2 c.cm. of a 25 per cent solution of sodium citrate was added to 40 c.cm. of blood.

Following protein injections, aseptic operations, and diseases an increase in fibrinogen associated with increased acceleration of sedimentation of the blood cells was first noted. Running parallel with the acceleration of sedimentation there was a considerable increase in the relative viscosity of the plasma. The surface tension in the plasma was decreased. By means of the Naegeli-Rohrer technique a considerable change in the relative proportions of albumin to globulin in favor of the latter was observed constantly in the presence of accelerated sedimentation. These changes were demonstrable also in the serum, but to a considerably less extent.

Of the stimulations mentioned, aseptic operations proved to be the most effective with regard to the constancy of their effect and the strength of the reaction produced. Such regularity was not always observed after single injections of protein. The physicochemical changes became more marked the more extensive the surgical interference.

THOMAS (Z.).

BLOOD AND LYMPH VESSELS

Matas, R.: Arteriovenous Fistula of the Femoral Vessels (Aneurismal Varix) on a Level with the Origin of the Profunda. *Surg. Clin. N. Am.*, 1922, ii, 1165.

The author reports the history of a healed shell wound in the right thigh over which a thrill was felt three months after the injury.

Palpation showed a decrease in the pulse of the dorsalis pedis and posterior tibial arteries as com-

pared with the left side. A slight pulsation which was visible 2¼ in. below Poupart's ligament extended upward and downward along the femoral vessels; the superficial veins above and below the scar were decidedly enlarged when the patient stood up. On palpation, an intense purring thrill was felt, which extended upward along the iliac vessels and downward to the internal condyle. Auscultation revealed at the level of the scar a typical loud systolic murmur which diminished in intensity upward and downward along the vessels from the scar. A loud venous roar was loudest over the scar and disappeared near the umbilicus above and the femoral condyles below. When the tip of the finger was pressed over the scar, the pulsations and bruits ceased, showing that this was the site of the anastomosis.

With the exception of these local disturbances, the general physical examination was negative. When the old scar which had remained over the site of the arteriovenous fistula was compressed with sufficient force to stop the thrill and the pulsations, the patient became conscious of his heart beat and the femoral pulse above the aneurism became slower. If the pressure was continued for a long time, he became faint and the blood pressure taken simultaneously with the pulse showed an increase. The instant the compression was discontinued the pulse rate rose to normal and the blood pressure fell to the original standard. This sign is designated as "Branham's bradycardiac phenomenon."

The investigation of the efficiency of the collateral circulation was carried out first by compressing the femoral artery immediately above the aneurism, and then by compressing both vessels with a compressor applied directly over the fistula. If the limb was completely exsanguinated up to the level of the fistula by elastic compression with an Esmarch bandage and the bandage kept in place for ten minutes while the common femoral vessels were occluded by compression, it was demonstrated that the collateral circulation had developed sufficiently to maintain a living circulation in the toes, foot, and leg in spite of the complete occlusion of the main vessels. This was demonstrated by watching the hyperæmic wave which followed the removal of an elastic bandage and constrictor applied from the toes to the level of the aneurismal communication. On removal of the bandage while the artery and vein were firmly compressed at the site of the anastomosis the hyperæmic wave was seen to rush down the thigh and to the middle of the leg with characteristic redness, and then with less intensity over the lower leg and foot, lingering and spreading over these parts and gradually replacing the waxy pallor of the exsanguination.

The operation was performed as follows:

1. An elastic bandage and constrictor was applied from the toes to the upper third of the thigh.

2. A vertical incision 6 in. long was made 2 in. above Poupart's ligament and down below the apex of Scarpa's triangle.

3. Poupart's ligament was exposed and the falciform process divided.

4. The common femoral artery and vein were isolated and the main artery and vein dissected to the level of the anastomosis, which was recognized as a hard, callous mass or bridge of scar firmly adherent to the vessels, binding and fusing them together in a dense, composite mass. The profunda artery was actively feeding the fistula; the vein also was supplied by its profunda branch.

5. The profunda was then recognized at its origin from the common femoral, about ¾ in. from the anastomosis and on the posterior side of the artery. The vein also accompanied it. It was too deep to isolate quickly, and in order to control it a flexible Doyen clamp was applied to compress the profunda midway between its origin and the fistula, thus effectively preventing the recurrent stream of the profunda from reaching the fistula.

6. The thick, callous margin of the scar tissue which connected the two vessels was excised. The adventitia was very weak at this point. A few silk sutures were passed through the adventitia (not perforating the artery) to reinforce the weak spot. When the sutures were tightened the bulge completely disappeared. The fistulous opening in the vein was sutured with a fine milliner's needle.

7. The falciform ligament was not sutured, giving additional cover to the artery and vein. The hyperæmic reaction which had spread rapidly to the toes after the removal of the constrictor left behind it a uniform pink, normal, living color. The pedal pulses were felt just as before the operation. A few minutes after the separation of the vessels and the restoration of the circulation to its normal channel the radial pulse rose rapidly from 90 to 110, then to 120, and finally reached the maximum speed of 130. After ten minutes, it descended until it reached the level of 118 and later 100.

It is possible that the sudden displacement of a large volume of blood into the limb on release of the constrictor may have contributed to the postoperative tachycardia through a momentary fall in the blood pressure.

Because of the collateral circulation through the branches of the internal iliac, it is only by direct compression of the abdominal aorta above the bifurcation or elastic circular compression around the waist when the subject is thin that a completely ischæmic field can be obtained in the iliofemoral region.

A few fundamental guiding principles to be observed are:

1. The suppression of the communicating channel or fistula without sacrifice of the vessels involved.

2. Prophylactic hæmostatic control.

3. Knowledge of the behavior of the peripheral circulation on suppression of the circulation in the main vessels at the site of the fistula whenever this is accessible to compression.

MORRIS H. KAHN, M.D.

Leriche, R.: The Technique of Peri-Arterial Sympathectomy and Some New Indications (La technique, et quelques indications nouvelles de la sympathectomie periarterielle). *Presse méd.*, Par., 1923, xli, 1101.

A number of investigators who have performed experimental peri-arterial sympathectomy upon animals have failed to observe the immediate decrease in the size of the vessel described by Leriche. Leriche answers these criticisms by stating that, with one exception, he too has never observed this phenomenon in any of the usual laboratory animals. One dog upon which he performed the operation showed immediate shrinkage of the artery but this could never be repeated. Leriche believes, therefore, that the results of peri-arterial sympathectomy can be studied only in man.

When the operation is performed upon normal arteries it is without danger. When the vessels are atheromatous, and especially in cases of senile gangrene, great conservatism is necessary. In the beginning, Leriche regarded it as necessary to perform the sympathectomy over 8 to 12 cm. of the vessel surface but he now lessens the extent of the operation.

Particular attention is called to the immediate local constriction of the vessel with secondary peripheral vasodilatation which follows excision of the sympathetic plexus about the vessel. These two phenomena distinguish the peri-arterial sympathectomy from simple arterial denudation. Following the operation there is a definite peripheral vasodilatation with an increase in the arterial pressure and an elevation of temperature. In the author's opinion this operation is applicable to numerous conditions, dermatology in particular, and diseases of the glands of internal secretion, especially those associated with a decrease of secretion.

LOYAL E. DAVIS, M.D.

Mayo, W. J.: The Significance of Lymphatic Involvement in Infections. *J. Am. M. Ass.*, 1923, lxxx, 221.

In the light of various experiences in the Clinic the author studied the relation of the lymphatics to the ultimate prognosis in tuberculosis, syphilis, and cancer, all introduced from without through the protective mechanism of the body, and two of which, tuberculosis and syphilis, have identifiable foreign causative agents. He states that we must ever remember Cohnheim's original observation that the source of a given infection can be detected if the sentinel lymphatic gland first showing enlargement can be located.

Besredka has confirmed the experimental work of Noetzel on anthrax. Noetzel demonstrated that rabbits and guinea pigs tolerate large numbers of anthrax bacilli injected directly into the blood or the peritoneal cavity without contaminating the cutaneous tissues, amounts which would cause a fatal anthrax infection if injected into the skin tissues which are rich in lymphatics. This shows that there is a definite relation between the site of the infecting organisms and their toxic effect, and discloses an inviting field for research.

Many of the most able exponents of the treatment of tuberculosis believe that if it is possible to remove the primary tuberculous focus where the bacilli enter the protective mechanism of the body, become adapted, and first involve the lymphatic system, the secondary processes will thereby be rendered much more amenable to treatment. These investigators evidently believe that, as Rosenow has found to be the case with many types of bacteria, the strain of tubercle bacilli becomes more or less specific to the individual. Surgical experience in the removal of localized tuberculous deposits gives some stability to this opinion.

The facts in relation to spirochætal involvement of the lymphatics are less easy to ascertain, but evidence shows that in a high percentage of cases the lymph nodes fail permanently to check the progress of the disease. There is much evidence suggesting that the glands may act as secondary foci in the distribution of spirochætes, while the defence reaction developed by their presence in the lymph nodes is to a considerable extent protective against the action of remedial agents. We know that in the spleen, which is a lymphoid organ, spirochætes are protected against remedial agents under certain conditions, that an arrest in progressive syphilis and remarkable improvement in the coincident anæmia follow the removal of the spleen, and that in such cases spirochætes are to be found in the spleen.

Rosenow's observations and experiments showing the specificity of organisms in relation to their secondary effects apply to syphilis. Fifteen varieties of spirochætes have been found experimentally, each seemingly with individual characteristics which can be shown in the living animal as well as in the test tube.

From various investigations made to determine the ultimate results following operation for carcinoma, particularly those of Sistrunk and Bloodgood, it can be said that the curability of cancer following operation for growths which can be locally removed depends more on the glandular involvement than on any other one factor. It would be conservative to say that two-thirds of all cases of removable cancers in which there is no glandular involvement will remain cured, and death due to subsequent local extension or blood transmission will result in only one-third.

One may even say that, other things being equal, the prospects of a cure of cancer depend more upon the lymphatic richness of the part affected than upon any other one factor. In from 80 to 85 per cent of cases of cancer of the body of the uterus, which is poor in lymphatics, hysterectomy results in a five-year cure, but in cases of cancer of the cervix, which has a rich lymphatic supply, it gives a five-year cure in only 25 per cent. Because of the sparseness of the lymphatics, a five-year cure follows

operation in 50 per cent of the cases of cancer of the large intestine. Incurability of carcinoma of the colon is more often due to secondaries in the liver caused by emboli broken off from cancer-infected venous thrombi than from carcinoma of the glands. In carcinoma of the stomach, which has a rich supply of lymphatics, a cure is obtained by radical operation in only 25 per cent of the cases.

The lymphatics are a system of absorbents. Twenty years ago Charles H. Mayo emphasized the fact that the lymphatics reach the height of their activity in adolescence, and like the tonsils, the spleen, and other lymphoid structures, slowly retrogress. This fact explains the relative curability, decade by decade, of carcinoma in the aged as contrasted with the rapid growth of malignant disease in the young.

The toxic agents are commonly distributed in three ways: through the blood, the distribution being exceedingly rapid; through the lymphatics, the distribution being slower; and by local extension from a pathologic lesion.

The arterial part of the capillary has greater pressure than the tissues, and the tissues have greater pressure than the venous part. The point should be emphasized that normally the blood capillaries pick up only molecular substances or extremely fine subdivisions, soluble in water, below the colloid dimensions. With the exception of the gastro-intestinal tract and liver (portal system), the blood capillaries are not normally pervious to colloidal substances, but these larger particles are taken up by the endothelial cells which act as phagocytes and by amœboid movements carry them into the lymphatics. Generally it is the function of the lymphatics as absorbents to pick up material substances insoluble in water, such as bacteria, protozoa, and cancer cells, which are too large to enter the blood capillaries. This absorption is effected through the agency of phagocytes which reach the lymphatics by diapedesis. The reactions in the lymph nodes represent the struggle of the gland to detoxicate the pathologic agents.

There are no lymphatics in the liver other than in the portal connective-tissue spaces. The star-shaped cells of Kupffer are endothelial cells with phagocytic properties lining the blood channels and sinuses of the liver. There is very little evidence to show that Kupffer's cells differ in function from similar phagocytic endothelial cells lining the blood sinuses in the spleen, lymph nodes, and other organs.

The voluntary muscles have no lymphatics outside the connective-tissue spaces of the muscle sheaths, a fact which accounts for their remarkable resistance to infection.

Herring and MacNaughten conclude that the lymphatics are probably not so numerous as is often believed, and that they are almost always confined to the true connective tissues. They have shown that the lymphatics are concerned with the absorption of solids and material which is insoluble in water, while the blood capillaries are concerned mainly with the absorption of material which is soluble in water.

The influence of secondary septic infection on the lymphatic manifestations of tuberculosis, syphilis, and carcinoma can hardly be overestimated. The tuberculous patient seldom dies from tuberculosis unless the infectious products are confined, producing injurious pressure, as on the brain; death results rather from the associated sepsis. When there are septic complications of tuberculous processes which are removable, the prospect of cure or improvement is greatly enhanced. In cases of tuberculosis it is very important to eradicate all foci of infection in the tonsils, teeth, etc.

In syphilis the prospect of successful lymphatic defense is not good, and a greater or small number of spirochætes escape from the lymphatic glands into the circulation. Undoubtedly there is more or less individual immunity to syphilis, but permanent arrest of the condition depends largely on specific medication, such as arsphenamin and mercury, rather than on spontaneously produced immunization. The removal of foci of infection and septic complications of syphilitic infection has been shown to be of great influence in aiding the arrest of the disease by appropriate treatment.

In cancer the prospect of successful glandular defense against the extension of the disease is exceedingly poor. There is reason to believe that in individual cases there is a certain immunity to cancer.

Clinical and pathologic experience teaches that in a large majority of cases carcinomatous involvement of glands means incurability of the disease. It is true that glandular defense may be efficient for a prolonged period, but when the lymphatics are involved in the cancerous process ultimate cure is confined to a small group of cases.

Experience has taught us the advisability of removing the primary source of the disease wherever possible, whether or not all of the involved lymph nodes can be extirpated, especially if the disease is situated in a septic region such as the stomach, intestines, and rectum. A palliative resection, even if all the enlarged glands cannot be removed, will often add three years or more of comfortable existence. The author has had patients for whom palliative resection of the stomach was performed without removal of all the infected glands, who lived for three or more years in comfort and apparent health. This occurred also in cases in which the liver contained metastatic carcinomatous nodules. Palliative operations which remove the primary source of the disease may permit the body's defense to exert its full strength on the glandular and other secondary lesions.

Not all enlarged glands associated with cancer, especially in septic situations such as the gastro-intestinal tract, are due to carcinoma. The glands may enlarge if a benign lesion, such as a chronic ulcer, precedes the carcinomatous change. Chronic

sepsis involving the glands is not infrequent; the glands may become so extremely hard as to appear malignant. This condition is quite constant in carcinoma of the large intestine.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Churchman, J. W.: The Reverse Selective Bacteriostatic Action of Acid Fuchsin. *J. Exper. Med.*, 1923, xxxvii, 1.

The selective bacteriostatic activity of gentian violet is now a well-established fact. If bacteria are exposed to this dye and planted on plain agar all the more common Gram-positive spore-bearing aerobes are killed even by relatively short exposure. What is true of gentian violet is true also in greater or less degree of other basic dyes of the triphenylmethane group.

The term "reverse selective activity" is used in this article to indicate a bacteriostatic property whose selective feature is the reverse of that of gentian violet.

The author discusses the activity of acid fuchsin and allied sulphonated substances under three headings, viz., penetration, chemical affinity, and method of ionization.

1. Penetration. The simplest explanation for the behavior of gentian violet and acid fuchsin toward bacteria is that the whole process is simply selective penetration. Gentian violet certainly penetrates Gram-positive bacteria, which it kills, more readily than Gram-negative bacteria, which it does not kill. That is to say, it penetrates the living organisms; tests of its staining power on fixed smears are of no value in this connection. The author found that gentian violet kills spores although it penetrates them little if at all, and by longer exposure may be made to penetrate Gram-negative bacteria which grow even when deeply stained. While under ordinary conditions of experiment, gentian violet is non-toxic for Gram-negative organisms, it may be made toxic for them by slightly increasing the temperature. Acid fuchsin also penetrates Gram-positive spore-bearers almost as readily as it penetrates those which are Gram-negative, but it kills the latter and spares the former.

2. Chemical affinity. That the reverse selective activity of acid fuchsin is in some way connected with the SO_3 radical in its molecule is strongly suggested by the results of experiments. The action might depend not so much on the presence of the sulphonic group as on the method of its bonding, although it is exhibited by substances such as chromotropic acid, in which the SO_3 group is firmly attached, as well as by substances such as sulphonic acid, in which the bonding is very weak.

3. Ionization. The method of ionization of the two groups of dyes whose action has been studied may explain their behavior. The fact that one group is basic and the other is acid is suggestive. If this explanation is correct, Gram-positive spore bearers and Gram-negatives differ in their hydrogen-ion concentration.

The author summarizes the results of his experiments as follows:

1. Acid fuchsin possesses a bactericidal power which is selective between Gram-negative and Gram-positive spore-bearing aerobic organisms. The selective feature is the reverse of that of gentian violet.

2. This reverse selective activity is possessed also by simpler sulphonated substances and appears to be dependent in some way on the presence of SO_3 radicals.

3. Selective penetration, if at all concerned in the behavior of gentian violet and acid fuchsin toward bacteria, must play a very minor rôle.

4. In the case of gentian violet the power to kill organisms and the power to prevent their growth run parallel so far as the selective feature is concerned. In the case of acid fuchsin, the bacteriostatic and bactericidal selective features do not run parallel.

5. Bacillus pyocyaneus, an organism resistant to gentian violet, is susceptible to acid fuchsin. This organism is the cause of annoying and persistent wound infections. The observations on the effect of the sulphonated substances may suggest a method of controlling these infections.

GEORGE E. BEILBY, M.D.

Banting, F. G., Campbell, W. R., and Fletcher, A. A.: Further Clinical Experience with Insulin (Pancreatic Extracts) in the Treatment of Diabetes Mellitus. *Brit. M. J.*, 1923, i, 8.

The authors have treated over fifty cases of diabetes mellitus with insulin. The most striking results were seen in children and young adults, but all of the patients were benefited. It is important to adjust the dosage of insulin so that the amount is sufficient to nullify the postprandial hyperglycæmia and yet insufficient to cause a dangerous lowering of the blood sugar.

At the end of the preliminary period of observation on a fixed diet the amount of urine excreted by the majority of the patients with severe diabetes was fairly constant. This determination is most valuable as an indication of the amount of insulin to be employed. In certain cases, however, the daily excretion of sugar varied and it was impossible to determine the proper initial dose of insulin. Under such circumstances it is advisable to begin with a moderate dose and increase it gradually until the desired effect is obtained.

After the patients were freed from glycosuria and ketosis they were permitted to use an adequate basal ration. As a rule they then felt so well that they demanded increased food because of a desire to exercise. Other factors which must be decided are the patient's most suitable weight and condition of nutrition and the means which should be employed to attain them; also to what extent work should be allowed. In the cases of stout patients it seemed un-

wise to allow an increase in weight; reduction of the weight was effected by decreasing the fat intake. In the cases of emaciated patients some increase in weight was believed desirable on account of the associated improvement in the general condition, resistance to infection, etc., even though an increased amount of insulin was required. The results of the experiments are summarized as follows:

1. Under treatment with insulin in cases not otherwise amenable to treatment glycosuria is abolished; ketones disappear from the urine and the blood; the blood sugar is markedly reduced and maintained at normal levels; the alkali reserve and alveolar carbon dioxide in cases of acidosis and coma return to normal; the respiratory quotient shows evidence of increased utilization of carbohydrates; and the cardinal symptoms of diabetes mellitus are relieved, well-marked clinical improvement being noted.

2. Insulin is a specific in the treatment of diabetic coma.

3. Hypoglycæmic reactions following the administration of insulin are relieved by the administration of carbohydrates and by the injection of epinephrin. GEORGE E. BEILBY, M.D.

Turrell, W. J.: Treatment by Diathermy. *Brit. M. J.*, 1923, i, 143.

The first effect of diathermy is an increase in the temperature of the part treated; the later effects are relaxation of the tissues and dilation of the blood vessels with a consequent increase in the blood supply to the part treated. The therapeutic effects of diathermy are therefore explained by the lowering of the blood pressure, the relaxation of spasm with the relief of pain, and the improved nutrition of parts whose blood supply has been deficient.

It is in the relief of spasm and pressure, and therefore of pain, that diathermy finds one of its important indications in clinical practice. Neuritis, deep-seated pain such as that associated with dysmenorrhœa, the spasm of a ureter excited by the passage of a calculus, the hypertonicity of the lumbar muscles in lumbago, or of the neck muscles in torticollis, the muscular rigidity of local tetanus, the pain of a recently sprained ankle, are usually markedly relieved and often cured by this treatment. Atrophic conditions improve very much because of the nutritional effects of the increased blood supply.

In surgical diathermy the heat is concentrated on one spot, while in the medical applications it is distributed over a large area. Surgical diathermy differs from the destruction of tissue by heated irons or the Paquelin cautery in that, when properly applied, it effects destruction by heat coagulation rather than by charring or incineration.

Intravesical growths, hæmorrhoids, benign or malignant superficial growths, lupus, moles, enlarged tonsils, nævi, etc. are suitable for this treatment. Diathermy is also a delicate and efficient method for depilation. SAMUEL KAHN, M.D.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Gassul, R.: Homoplastic Transplantation of Explants from Adult Frog's Skin (Homoplastische Transplantation von Explantaten aus erwachsener Froschhaut). *Deutsche med. Wchnschr.*, 1922, xlviii, 1163.

The author placed frog's skin in the plasma of the frog, rat, chicken, and guinea pig, and in human blood plasma, and after varying intervals grafted this tissue upon the animal in whose serum it was placed.

The transplantation to the frog was successful; the remaining so-called homoplastic transplants, after three to five days of apparent healing, were desquamated. The author draws the conclusion, nevertheless, that the superficial tissue in a heterogeneous medium develops heterogeneous characteristics, and considers it well worth while to determine whether heteroplastic tissue in a homogeneous medium will act as homoplastic tissue.

MEYER (Z).

Torraca, L.: The Accumulation in the Peritoneal Cavity of Gases Injected into the Veins (Sull' accumolo nella cavità peritoneale dei gas iniettati nelle vene). *Riforma med.*, 1922, xxxviii, 1205.

In a previous article the author reported experiments demonstrating that oxygen injected into the jugular vein may accumulate in the peritoneal cavity. In this article he states that the same phenomenon occurs when nitrogen and carbon dioxide are injected. The experiments were made on guinea pigs. The only important difference observed was that the animals died much more quickly following the injecting of the two gases than after the injection of oxygen.

Previous observers believed that the injected gas traverses the pulmonary circle, spreads to the left heart, and reaches the subperitoneal vascular territory through the arterial network. Torraca believes the mechanism may be different because in many cases a very large quantity of gas is found in the inferior vena cava and its branches (especially the renal veins) as compared with that found in the left heart and the arteries, and because the quantity of gas which can be made to collect in the peritoneum by increasing the pressure and duration of the injection compares well with that contained in the left heart and the arteries.

The assumption seems permissible that the gas reaches the right auricle from the superior vena cava whence it spreads into the underlying ventricle and then passes into the inferior vena cava and by the retrograde route into the venous system of the lower part of the body. In this way it reaches the subperitoneal regions directly by the venous system and enters the peritoneal cavity by passing through the venous walls. This view is supported by the fact that the phenomenon can be produced in the cadaver. W. A. BRENNAN.

Olivier, E.: The Topography of the Nerves of the Brachial Plexus and Axillary Vessels at their Entrance into the Subclavicular Space (Note sur la topographie des nerfs du plexus brachial et des vaisseaux axillaires à leur entrée dans le creux sous-clavier[ulaire]). *Presse méd.*, Par., 1922, cli, 1168.

The divergence of opinion relative to the anatomical relation of the cords of the brachial plexus to the axillary vessels led the author to investigate this question. Opposite the first rib the axillary artery is situated lateral to the vein and is separated from the subclavicular muscle and the vein by the nerve to the pectoralis major muscle. At this point it is very difficult to ligate the artery as it is partially overlapped by the vein medially and is closely associated laterally with the medial and posterior cords of the brachial plexus. Here the cords of the plexus lie lateral to the artery and are intimately bound together.

Distally they gradually course from without medially and from a superficial to a deeper plane. The lateral cord is most superficial, closely adherent to the under surface of the subclavicular muscle, and in the same plane as the large subclavicular lymphatic gland. Lateral to this cord lies the subscapular nerve. Behind it and in a deeper plane is the nerve to the serratus anterior muscle. Immediately below it and medial to the lateral cord lies the medial cord of the plexus. This structure is crossed anteriorly by the nerve to the pectoralis major which has divided into two branches. The posterior cord lies upon a deeper plane and in the angle formed by the axillary artery and the first rib. Gradually it comes to lie between the artery and the upper surface of this rib.

In ligating the artery beneath the clavicle it is therefore necessary to exercise great care in separating the overlying structures and in passing the ligature to avoid injuring the posterior cord of the plexus.

LOYAL E. DAVIS, M.D.

Felix, W.: Anatomical, Experimental, and Clinical Investigations Concerning the Phrenic Nerve and the Innervation of the Diaphragm (Anatomische, experimentelle und klinische Untersuchungen ueber den Phrenicus und ueber die Zwerchfellinnervation). *Deutsche Zeitschr. f. Chir.*, 1922, clxvi, 283.

In the present research the author has brought forward the following questions: (1) To what viscera does the phrenic nerve furnish the sensory nerve supply, and what is the nature of this sensation? (2) What is the significance of the connection between the phrenic and sympathetic? (3) How is the musculature of the diaphragm innervated, and what is the sensory nerve supply of its serous coverings? (4) Can the typical section of the phrenic nerve be so modified that it includes the accessory nerves which occur as frequent variations?

The anatomical investigations undertaken to answer the questions consisted in following the course and distribution of the phrenic nerve in a series of human embryos and in attempting to determine its communications with other nerves. In addition, the author gives a review from the literature of the variations occurring in the course of the phrenic, and of their topography from a surgical standpoint.

The results of these investigations are summarized in the following statements:

1. The phrenic nerve furnishes the sensory nerve supply to the diaphragmatic pleura and to the peritoneum covering the diaphragm. It does not give any branches to the pericardium. The diaphragmatic pleura and the peritoneum covering the diaphragm contain sensory fibers from the phrenic nerve only in their central portions, and particularly in the lumbar portions.

2. In the neck the phrenic nerve receives one or more small branches from a plexus (plexus suprapleuralis) which is primarily sympathetic and ganglionated and which lies upon the dome of the pleura. Since branches from the last cervical and first thoracic nerves take part in the formation of the suprapleural plexus, the branches of the plexus which pass into the phrenic nerve may contain spinal fibers in addition to their principal sympathetic component.

3. In the subperitoneal connective tissue of the diaphragm, particularly in the lumbar area, the phrenic nerve anastomoses with the sympathetic nerve. At that point there is an essentially sympathetic ganglionated plexus called the "plexus phrenicus." Branches of the cœliac plexus, the phrenic ganglion, and numerous sympathetic ganglia participate in its formation.

4. Since all the branches of the phrenic nerve which have sensory endings in the serous coverings of the diaphragm communicate with the sympathetic, it is possible that the sensory branches of the phrenic nerves are formed of sympathetic fibers. Since a few of the motor branches of the phrenic communicate with the sympathetic, it is possible that the sympathetic also carries fibers for the musculature of the diaphragm.

5. In its entire course the phrenic nerve contains non-medullated sympathetic fibers. They lie united in bundles in the periphery of its transverse section.

6. The lowest intercostal nerves (eighth to twelfth) take part in the sensory innervation of both the serous coverings of the diaphragm. They innervate a ribbon-like strip upon that portion of the diaphragm which takes origin from the ribs.

7. The twelfth intercostal nerve supplies motor fibers to the serration of the diaphragm coming from the twelfth rib. This may also be established embryologically since the isolated absence of this serration in a case of congenital hernia of the diaphragm points to a special innervation.

The author gives the following summary of the variations and topography of the phrenic nerve:

Among the variations of the phrenic nerve there are two of especial importance for the surgeon. First, certain portions of the phrenic trunk may

take an abnormal course (accessory phrenic), and therefore are not divided in section of the phrenic nerve. Secondly, these accessory nerves may take the form of a single nerve at the lateral border of the scalenus anticus. This is a rare variation. A number of anatomical facts suggest that the operative exposure of the phrenic nerve above the omohyoid muscle is more practical than that below.

The clinical part of the work attempts to answer the following questions: (1) What is the basis of the generally accepted conception as to the sensory function of the phrenic nerve? (2) What is the significance of the connection between the sympathetic and phrenic nerves? (3) In using local anæsthesia in intrathoracic operations must the phrenic nerve be blocked in order to anæsthetize the parietal pleura, the pericardium, and the peritoneum covering the diaphragm? (4) Can section of the phrenic nerve be so modified that all of its motor fibers as well as those of the accessory phrenic nerves for the half of the diaphragm concerned will be divided?

On the basis of his own experimental investigations with stimulation of the central stump after section of the phrenic nerve, and from his own clinical observations the author concludes that the phrenic nerve is able to transmit impulses centralward, and that this is the explanation of the long-recognized shoulder pains in affections involving the course and distribution of the phrenic nerve. Pain in the summit of the diaphragm and in the upper abdomen, on the other hand, is to be ascribed, not to the phrenic nerve, but to the intercostal nerves. Moreover, the author comes to the conclusion that the sensory function of the phrenic depends upon the sympathetic fibers it contains. A stimulation of the sympathetic serous endings of the phrenic nerve in the diaphragm is followed by the peripheral projection of sensation in the region of the supraclavicular nerves of the central nervous system. Upon stimulation of these sympathetic fibers of the phrenic nerve depend also the frequently occurring abnormal contractions of the diaphragm, as, for example, in singultus. The answer to Question 3 follows from the results of the anatomical investigations.

Finally, upon the basis of twenty-eight cases—among them ten cases with an accessory phrenic nerve—in which sections of the phrenic with subsequent exairesis (extirpation of the peripheral stump from the thorax) was carried out, this method is recommended as the safest to secure paralysis of half of the diaphragm. MEYER (Z).

ROENTGENOLOGY AND RADIUM THERAPY

Schmitz, H.: A Summary of the Determination of X-Ray Intensities. *J. Radiol.*, 1923, iv, 10

In a previous communication the author reported investigations made by himself with regard to roentgen-ray intensities. These investigations were carried out to determine a method of treatment for deep carcinomata which would assure the application of roentgen rays of a sufficient intensity to cause degeneration or death of the cancer growth. The constant factors were a maximum kilovoltage of 130, determined with a sphere gap in series with the tube terminals, a milliamperage of 5, and a broad-focus Coolidge tube 18 cm. in diameter. The variable factors were the distances from the focus or target of the tube to the surface of the skin, the ports of entry, and the filter. A summary of the results obtained is given in tables and the conclusions reached at that time are again presented.

With the collaboration of Bachem, the investigations have been extended to crest kilovoltages of 150, 175, 200, and 220. The results are shown in a table. The clinical application of these results and economic considerations, viz., the saving of the tubes by the avoidance of large loads, led to the adoption of the following factors: maximum kilovoltage, 200; milliamperage, 5; focal skin distance, 50 cm.; field, 20 to 30 cm. square; filter, 1 mm. copper plus 1 mm. aluminum. The number of fields is two, an anterior and a posterior. It is necessary only to determine the anteroposterior diameter. The advantages gained by the newer method are:

1. Shortening of the time duration of the application of the roentgen rays. If 5 ma. are used the two-field application consumes from three to four hours. The method using a maximum kilovoltage of 130 consumes from twelve to fourteen hours.

2. Radiation sickness is not nearly as severe when the maximum kilovoltage is 200 as when it is 130. Apparently the destruction of the blood corpuscles and normal tissues is less severe than with the old method.

3. The tumor is more rapidly resorbed, evidently because of the greater biological action of the short-wave roentgen ray. It must be assumed, though it cannot yet be proved, that the shorter the wave length of the radiation the more intense the biological action on the tumor cells. The gamma rays of radium have the shortest wave length of any radiation known. Gamma rays of radio-active substances cause a much more rapid regression of cancer tumor than any roentgen ray produced so far.

4. The same intensities of radiation may be closely reproduced if the same factors, that is, kilovoltage, focus skin-distance, filter, size of field, and tube, are employed. It is advisable, however, to determine the duration of the application carefully for each transformer and for each tube.

ADOLPH HARTUNG, M.D.

Glasser, O.: Newer Investigations of the Problem of Roentgen-Ray Dosage. *Am. J. Roentgenol.*, 1923, x, 1.

In the investigations reported a sharp distinction was maintained between the problems of absolute dosage and those of relative (practical) dosage. The author states that the solution of the problem of absolute or scientific dosage on the basis of the mechanism of ray effect should lead to the construction of an ideal dose-measuring apparatus.

Mention is made of previous work done along the same line. A detailed description of ionization chambers used in the investigations is given. The results are presented by curves. Most of the subject matter of the article is highly technical and considered from the viewpoint of the physicist rather than that of the physician.

ADOLPH HARTUNG, M.D.

Failla, G.: Ionization Measurements. *Am. J. Roentgenol.*, 1923, x, 48.

During the last few years ionization measurements have assumed considerable importance in radiation therapy. In order that information relating thereto may be readily available, the author has summarized briefly the essential facts of such measurements. He defines ionization and ionization currents at some length and describes in detail measuring instruments used to determine their amount as produced by radiations from radium and roentgen rays.

It is very probable that the biological effects of radiation are closely related to the ionization produced in the tissues irradiated. As the ionization cannot be measured directly, the attempt is made to correlate biological effects and ionization in the air of an ionization chamber.

In conclusion, the author states that ionization measurements of radiation for therapeutic purposes are reliable provided the quality of the radiation and the distribution of the ionization in the chamber are not very different for the different measurements. The instrument must be properly designed and constructed as regards the type of ionization chamber, insulation, electrical shielding, screening from extraneous radiation, and saturation, and should be calibrated every day, or oftener if a change is suspected, by means of a radium standard.

ADOLPH HARTUNG, M.D.

Smithies, F.: The Necessity for Caution in the Employment of High-Voltage Roentgen Rays as a Therapeutic Agent Against Malignant Disease: Acute Adrenal Insufficiency and Death as Sequelæ. *Surg., Gynec. & Obst.*, 1923, xxxvi, 61.

Medical literature contains very few, if any, warnings against the new high-voltage roentgen therapy. Articles are concerned chiefly with the gross effects of the treatment upon the neoplasm, giving scant attention to pathologic changes in tissues apart from those in which tumors are situated or to the clinical phenomena observable in cancer hosts.

The case reported by Smithies was that of a man 56 years of age who fell on his back from a horse. As soreness of the back persisted, roentgenograms were made. The diagnosis was early osteosarcoma. Roentgen therapy with a voltage of about 230,000 was advised and accepted. Three séances lasting "several hours at least" were given. So far as could be ascertained, one treatment was given through and through from the back, directly over the supposedly sarcomatous area, and two cross-fire treatments were given from the back at an angle of about 60 degrees to the spine. The patient was then sent home.

There were no immediate ill effects, but within a month, symptoms which became progressively worse led to a diagnosis of Addison's disease. Death occurred within four months.

In his résumé the author states that instances of "acute" or "fulminant" Addison's syndrome are rare, and that it is most unusual for the disease to develop after the age of 50 or for death to occur within a year. It appears to Smithies improbable that in the case reported the patient's fall caused acute bilateral adrenal injury and failure. The man was in good health when he sustained what seemed to be nothing more than bruises of the paraspinal muscles and he remained well, despite his slight muscular lameness, until a few weeks after the roentgen exposures. Thereafter his collapse was rapid.

The proximity of the adrenals to the areas treated by the high-voltage roentgen rays for long time-intervals strongly suggests that the treatment was responsible for the acute collapse of adrenal function and doubtless for the destruction of chromaffin tissue.

Unfortunately autopsy was not permitted.

ADOLPH HARTUNG, M.D.

Gaylord, H. R., and Stenstroem, K. W.: Comparative Measurements Between Radium and X-Rays Concerning Energy Absorbed at a Depth. *Am. J. Roentgenol.*, 1923, x, 56.

Having at their disposal an adequate amount of radium, and roentgen-ray apparatus capable of continuous operation at 200,000 volts, the authors attempted to determine the relative penetrating quality of these two agencies by measurements at similar distances and similar distribution. The measurements were made with ionization chambers built according to the description given by Friedrich. Some of the experiments made are described in detail and the results tabulated.

The authors conclude that for external radiation such huge amounts of radium would be required to compete with existing roentgen equipment that the cost would be prohibitive. Moreover, the difficulty of obtaining adequate protection from such large amounts would constitute an insurmountable obstacle.

In some instances moderate amounts of radium in properly arranged packs will be found to meet special conditions better than the roentgen rays, but these cases are few. With the improvements which may be expected in the near future, the field of usefulness of the radium pack of moderate size will be increased. The advantages of the roentgen rays apply only to external radiation. In cases in which the growth can be reached and radium or emanation of radium can be planted into the sub-

stance of the tumor the roentgen rays cannot displace radium, but they may be usefully combined with the implantation. ADOLPH HARTUNG, M.D.

Daland, E. M.: Radium Treatment of Keloids. *Surg., Gynec. & Obst.*, 1923, xxxvi, 63.

Many methods of treatment have been tried in the attempt to find a cure for keloidal growths, but until the appearance of light therapy none was uniformly satisfactory. The Finsen ray proved fairly effective, and the roentgen ray more so, but in the opinion of the author, radium is the best therapeutic agent thus far discovered.

Fifty-eight cases are discussed in this article. Forty-eight were treated with radium alone. Many different methods of treatment were tried to ascertain which would yield the best results. It was noted that there was a fairly definite relationship between the age of a keloid and the amount of radiation necessary to eradicate it. Keloids in children responded more quickly to treatment than those in adults. The majority of the adults were treated with steel-jacketed tubes laid directly on the lesion or raised on 2 to 5 mm. of gauze. The average dose per tube was 15 mc.-hrs., and the average number of treatments, six. No two cases required exactly the same dosage. In some, 10 mc.-hrs. caused very little reaction, while in others, 30 mc.-hrs. caused only slight redness. Occasionally 0.5 mm. of silver was used when the unfiltered tube caused excessive reaction.

Ten of the forty-eight cases are still under treatment. In twenty-six of the others the lesion has been completely destroyed. Three patients ceased treatment before a sufficient number of applications had been made. In two cases the results were unsatisfactory as the keloids, which were of long duration, were treated with too heavy filtration. There have been no recurrences, either in the cases treated by absorption doses or in those treated to actual destruction of the lesion. In two cases new keloids developed near the old ones. Every case treated was benefited. The first evidence of relief was the development of a certain degree of anæsthesia in the lesion. Later the itching and pulling sensation ceased. Finally there was softening of the scar. In the cases treated with absorption doses there was less variation from the normal color of the skin. In a few of the cases treated with ulcerating doses there was telangiectasis, but this was by no means always a sequela.

The author draws the following conclusions:

1. It seems probable that every keloid can be destroyed by radium if a sufficient dose is used.

2. Silver filtration (1 mm.) should be used for keloids of recent origin, in the cases of children, in the cases of persons with a dark complexion, and in exposed areas such as the face. The dosage should be from 30 to 60 mc.-hrs. according to the age of the patient.

3. On all other keloids practically unfiltered tubes should be used. The dosage should be from 15 to 30 mc.-hrs. per tube. It should be explained to the patient that ulceration will result from this treatment.

4. There is no evidence to show that the destructive doses damage the tissues so that the lesions will recur. There is no lessening of the tendency of the individual to develop keloids.

ADOLPH HARTUNG, M.D.

Levin, I., and Levine, M.: The Action of Buried Tubes of Radium Emanation on Neoplasias in Plants. *J. Cancer Research*, 1922, vii, 163.

Normal tissues used in the experiments consisted of young and adult roots of the purple-top turnip and the growing tips of the tobacco plant. The pathologic material consisted chiefly of club roots artificially produced on cabbage and kohlrabi, and crown galls on the geranium. Capillary tubes 3 mm. long and 0.25 mm. in diameter containing radium emanation were introduced into the plant through a small opening made by means of a sterile needle.

The tube of radium emanation was left buried in the tissue for from one to fifteen days, the plants being examined carefully during that time at regular intervals. For controls, empty tubes of the same size as those containing the emanation were inserted into identical tissues.

In the normal adult tissue the only perceptible result from the insertion of a radium emanation tube was complete destruction of tissue in the immediate vicinity of the tube. In the tissue beyond this area there was no change corresponding to that noted in animal tissue. Adult tissue was not affected by moderate amounts of gamma radiation.

DAVID R. BOWEN, M.D.

LEGAL MEDICINE

Ottenberg, R.: The Medicolegal Application of Human Blood Grouping: Sources of Error in Blood Group Tests and Criteria of Reliability in Investigations on Heredity of Blood Groups. *J. Am. M. Ass.*, 1922, lxxix, 2137.

The author considers Vincent's open-slide method the best test for blood compatibility. To one drop of serum on a slide is added one drop of cell emulsion. The slide is tilted and rotated gently every few minutes to distribute the cells evenly. Agglutination is easily seen with the naked eye in from one to ten minutes at room temperature. Observation should not be longer than fifteen minutes. The microscope should not be used. Genuine agglutination is always visible to the unaided eye. If the slides are not moved after the first fifteen minutes, the film may be dried, painted with a layer of collodion, and kept for a permanent record.

In the test-tube method too much serum is required and weak agglutination may be overlooked. The modified Wright capillary-pipette method calls for too much glassware and expertness. In the hanging-drop method with hollow ground slides

settling of the red corpuscles suggests massive agglutination.

Sources of error in the test are: deteriorated or weak sera; hæmolysis; incubation at 37 degrees C.; drying; settling of the cells; microscope observation; dense cell emulsions; undeveloped group characters in children; and auto-agglutination.

As precautionary measures the author recommends duplicate tests with different sets of test sera shown to be active at the time of the tests; tests of both the serum and the cells whenever there is doubt; and examinations of the cell emulsion without the addition of test serum.

In studies of human heredity the accidental inclusion of cases of illegitimacy can best be avoided if the mother of each family understands the object of the examinations and consents to them.

The instances in which it is possible to predict the remaining parent when the children and one parent are known are shown in the following table. Children of Group 1 are disregarded because, as they show only recessive qualities, they can come from any combination of parents. The occurrence of additional children of Group 1 does not alter the prediction as to the remaining parent.

PREDICTION OF REMAINING PARENT GROUP

Known children Groups	Known parent Groups	Other parent must be in Groups
2	1	2 or 4
2	3	3 or 4
3	1	3 or 4
3	2	2 or 4
3	4	3
4	2	2 or 4
4	3	3 or 4
2 and 3	1	4
2 and 3	2	2 or 4
2 and 3	3	3 or 4
2 and 4	1	4
2 and 4	2	2 or 4
2 and 4	3	3 or 4
3 and 4	1	4
3 and 4	2	2 or 4
3 and 4	3	3 or 4
2, 3, and 4*	1	4
2, 3, and 4	2	2 or 4
2, 3, and 4	3	3 or 4

*This combination of children Groups 2, 3, and 4 has not been described in the literature. Gartner points out that its occurrence would depend on occasional "crossing" in the chromosomes.

WALTER C. BURKET, M.D.

GYNECOLOGY

UTERUS

Grad, H.: The Pathology of Uterine Bleeding in 100 Analyzed Cases. *Am. J. Obst. & Gynec.*, 1923, vi, 37.

From the study of the pathologic findings in 100 cases of uterine bleeding here reported it was found that the cases may be divided into six classes according to the causes of the loss of blood from the uterus. These causes include pregnancy, infection, neoplasms of the uterus and ovaries, displacements, lacerations, congestion, endocrine distress, constitutional causes, and blood dyscrasias.

In 70 per cent of the cases the pathologic changes in the endometrium played the most important rôle in uterine bleeding. In thirty-four cases the chief cause of the endometrial pathology was infection; in twenty-five cases, a neoplasm; and in eleven cases, hyperfunction of the ovaries.

Uterine bleeding is caused also by vascular engorgement of the uterus and adnexa and focal infection of the generative organs.

Pregnancy, including ectopic gestation, is a very important etiological factor of uterine bleeding. It was present in thirteen cases.

Constitutional causes are of minor importance.

After incomplete abortion the endometrium undergoes the physiologic change incident to menstruation, but the uterine cavity may harbor retained secundines which cause continued uterine bleeding.

In cases of uterine bleeding with a history of infection, the bleeding is due to a diseased endometrium, the adnexa remaining perfectly normal.

Curettage of the uterus is a very important procedure in cases of uterine bleeding, as the bleeding may depend entirely on the condition of the endometrium even though other pathologic entities may be present, such as adnexal disease, fibroids, etc.

Two or more causes may operate in the same case at the same time.

Adenoma polyposum of the endometrium is responsible for uterine bleeding in a large number of cases (at least 20 per cent) and is a distinct entity. Uterine glands penetrating the musculature may also be a cause.

There are a certain number of cases of uterine bleeding in which the cause is obscure, no pathologic changes being found to account for the hæmorrhage (eleven in the series reviewed). These have been called cases of ovarian hyperfunction.

In a certain number of cases the uterine bleeding depends on displacements and lacerations causing vascular engorgement and "focal infection."

Submucous fibroids cause uterine bleeding by bringing about changes in the endometrium overlying the neoplasm.

In a very small number of cases uterine bleeding may be caused by degeneration of a neoplasm, the necrosis causing cell destruction and the escape of blood directly into the uterine cavity.

E. L. Cornell, M.D.

Norris, C. C.: The Microscopic as Compared with the Clinical Diagnosis of Malignant Uterine Neoplasms. *Am. J. Obst. & Gynec.*, 1923, v, 1.

Cancer of the cervix can generally be diagnosed correctly by clinical methods. Of a series of 253 cases, 81.4 per cent were diagnosed positively by the clinician, and 11.4 per cent were suspected. In only 2.3 per cent was malignancy unsuspected by the clinicians.

In carcinoma of the cervix the lesion is not only fairly characteristic clinically, but also easily accessible to inspection and touch, and can be examined thoroughly during the course of an ordinary gynecological examination. Furthermore, in doubtful cases, biopsy is a simple procedure.

Of the 253 cases studied, only 16 per cent were in the early stages. Carcinoma of the cervix gives a relatively small proportion of five-year cures, regardless of the method of treatment. The urgent necessity for early diagnosis is therefore apparent.

In carcinoma of the fundus conditions are different. The lesion can neither be inspected nor palpated, and for final diagnosis even the experienced gynecologist is forced to depend more or less upon microscopic examination.

There are many intra-uterine lesions which may be confused with carcinoma. One of the most common is carcinoma combined with myoma. An analysis of the cases studied shows that at least 75 per cent of the erroneous diagnoses were due to this condition. Of the 101 cases of carcinoma of the fundus no fewer than twenty were diagnosed clinically as benign, fifty-seven were diagnosed clinically as positive, and in an additional twenty-four malignancy was suspected. This is sufficient evidence to prove the importance of routine histologic examination.

Of the entire series of 101 cases of carcinoma of the fundus, curettings alone were submitted to the laboratory in fifty-eight cases. The clinical diagnosis was positive in twenty-one (36.2 per cent), the clinical diagnosis was doubtful or malignancy was suspected in twenty-two cases, and the condition was regarded as benign in fifteen (25.8 per cent).

The frequency of sarcoma has been greatly overestimated in the past, some pathologists asserting that 10 per cent of all myomata possess malignant characteristics. The author reviews thirty-five cases of sarcoma. During the same period of time

that these cases were treated 1,216 fibromyomata of the uterus were removed. Of the thirty-five malignant connective-tissue tumors, only eight appeared to be degenerations of previously benign neoplasms. Therefore in this series sarcomatous degenerations of myomata occurred in only about 0.8 of 1 per cent of the cases. None of the patients with myoma has had a recurrence, but over 80 per cent of those with sarcoma are dead.

Chorio-epithelioma ta vary markedly as regards malignancy. A diagnosis from the curettings alone is often impossible. The author has encountered only six cases. Three of these were manifestly malignant and were readily diagnosed from the curettings.

In the entire series of 391 cases of malignant tumors the clinical diagnosis was positive and correct in 272 (69.5 per cent); the true condition was suspected in an additional fifty-nine cases (15 per cent); the clinical diagnosis was malignancy but the type of neoplasm was not recognized in fifteen (3.8 per cent); and the condition was regarded clinically as benign and its true character determined only on histologic examination in forty-five (11.5 per cent).

In conclusion the author states that the laboratory should have the benefit of clinical evidence in all cases, and the follow-up of the clinic should serve as a check on the laboratory diagnosis.

E. L. Cornell, M.D.

EXTERNAL GENITALIA

Girard, F. R.: Posterior Vaginal Drainage, with a Description of a New Instrument Used as a Vaginal Pelvic Guide. *California State J. M.*, 1923, xxi, 9.

The author has devised an instrument which he believes is new. He describes it as a clamp approximately 25 cm. long with a double curve. When closed, the end forms an oval ball 3.5 cm. wide and 2.5 cm. high. The anterior surface of the ball is grooved transversely. The operator feels this groove through the stretched tissues of the posterior fornix and makes his incision directly down on the ball of the instrument, thus avoiding injury of the rectum, which is held back by the lower half of the ball while the back of the cervix is pushed forward by the upper half. If a large opening is desired, a crucial incision can be made at will with the ball as a guide.

When there is a possibility that vaginal drainage will be desired, the vagina should be cleansed before the operation is begun by scrubbing it with green soap and water, washing it with a solution of lysol, and painting with a 2 per cent solution of iodine.

The tip of the instrument is dipped into a sterile lubricant or soap solution, and inserted between the labia just below the urethra. The handle of the instrument is held pen-fashion and the instrument pressed downward and forward so that the rounded extremity slides along the posterior wall of the vagina. As the instrument is introduced the handles are depressed until they are opposite the vaginal orifice, when the rounded extremity of the instrument will be found stretching the posterior fornix. The instrument can be inserted by a nurse, and there is no possibility that it will be inserted into the urethra or rectum.

After the operator has made his incision, the clamp is opened by the assistant and drainage material is placed between the jaws of the guide and withdrawn into the vagina.

The author uses a paraffin gauze drain which can be laid in strips between plain gauze and the wound or used as a casing for a cigarette drain. These drains are removed gradually by shortening them an inch or so on the fourth day, removing half on the fifth day, and removing all the remainder by the sixth or seventh day.

It is sometimes necessary to dilate the opening in the posterior fornix if it shows a tendency to close up rapidly and dam back the secretions in the pelvis. Following the removal of the pelvic drains, the sinus should not be irrigated. If the discharge is abundant, the author advises gentle mopping out with gauze.

C. H. Davis, M.D.

MISCELLANEOUS

Frank, R. T.: The Treatment of Cystocele, Rectocele, and Uterine Prolapse. *Am. J. Obst. & Gynec.*, 1923, v, 8.

Childbirth causes injuries to the muscular, fascial, and connective-tissue structures of the pelvis. The triangular ligament may be torn, one or both of the puborectal loops of muscles may be avulsed from the pubic bones, the genital hiatus may be greatly dilated, or the pubocervical fascia may be split. It is not always possible to define or recognize the tissues most injured. In general, however, three main types of injury result and can be recognized and corrected.

The signs of these injuries appear either separately or combined in the form of cystocele, rectocele, and prolapse of the uterus.

Not every case of cystocele and prolapse requires operative intervention. Many women should be tided over the period of child-bearing by palliative measures.

If the perineum is intact, a cystocele alone may be retained by a Skene or a Gehrung pessary.

Prolapse of the uterus in a young woman who desires to have more children may be kept back with simple pessaries such as the saucer pessary of Schatz, the hard rubber ring, and the globe and egg-shaped pessaries. It is unwise to operate upon old debilitated women who are poor operative risks. In such cases also pessaries should be used.

If operation is to be performed upon a woman who desires to have more children, the vaginal tube and outlet must not be unduly narrowed. Care must be exercised in repairing the cervix. Trachelorraphy according to Emmet's method is preferable to amputation or trachelioplasty (by coring) because amputa-

tion frequently induces sterility or, if pregnancy supervenes, causes severe dystocia. If the uterine body is displaced, either retroflexed or retroposed, the corrective operations should aim to shorten the round ligaments and should not fasten the uterus to the abdominal wall.

In the cases of women who are to be sterilized at operation or who have passed the menopause three methods of operation may be considered:

1. Repair of the anterior and posterior vaginal wall and perineum from below, followed by ventrofixation.

2. Interposition of the uterus between the inferior bladder wall and the vagina, and repair of the perineum.

3. Vaginal hysterectomy with suture of the lateral stumps below the bladder followed by perineal repair.

In the cases of very old women and those in which there has been a severe recurrence of prolapse after vaginal hysterectomy, obliteration of the vagina may be done.

With very few exceptions the author found that the first method, repair of the cystocele and rectocele from below combined with either the Alexander-Adams operation or ventrofixation from above, is applicable to all varieties of prolapse.

Occasionally, in the cases of short fat women, when laparotomy is relatively hazardous and a large cystocele causes the most serious disability, he has used the interposition operation.

He has never employed vaginal hysterectomy with utilization of the broad ligament stumps as described by Goffe, and would reserve this procedure for those rare cases of prolapse in which a vaginal hysterectomy is indicated for some other condition such as corporeal cancer. In a number of cases this technique was followed by huge recurrences of the cystocele. Such recurrent cystoceles may prove incurable, as the central support of the pelvic connective tissue from which the supporting fibers radiate, namely, the supravaginal part of the cervix, has been removed.

The repair of cystocele consists in separation of the descended bladder from the uterine cervix, repair of the pubocervical fascia in the median line, and suture of this structure high up to the cervico-uterine juncture so as to re-establish a tense continuous bladder shelf.

Repair of high rectocele consists in exposure of the anterior rectal wall high up, opening of the Douglas cul-de-sac, obliteration of this pouch by circular suture, and repair of the torn rectal fascia. This repair is usually combined with repair of a low rectocele and a torn perineal body.

The repair of a low rectocele and a lacerated perineum consists in exposure of the anterior rectal wall and separation of the levator edges and triangular ligament *en masse*.

If the anatomy of the pelvic outlet is understood, if cases are judiciously selected, and if the technique described is followed, the results are fully as satisfactory as those obtained by the radical treatment of inguinal hernia, but a certain number of recurrences are to be expected, especially in the cases of patients with flaccid tissues and general enteroptsis. It should be emphasized that patients whose complaints and pains did not arise from the minor lacerations of the cervix, the small cystocele, and the negligible rectocele present will not be benefited by unnecessary plastic repair. E. L. Cornell, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Rowley, W. N.: Observations on the Blood Sugar During Pregnancy and the Puerperium. *Am. J. Obst. & Gynec.*, 1923, v, 23.

Determinations were made of the sugar content of the maternal blood at, or before term, and on the second morning after delivery. The sugar values of the cord blood were also studied. In the series reported none of the patients had diabetes or glycosuria. The average blood sugar of fifty-three women during pregnancy was 0.11 mgm. for each 100 c.cm. The average value for the cord blood was 0.09 mgm. for each 100 c.cm. The effect of anæsthesia on this value is negligible. From these findings the author concludes that the placental interchange of glucose can take place by the process of diffusion from the maternal side to the fetal side. The average postpartum value of the blood sugar was 0.14 mgm. for each 100 c.cm. Hence, the sugar content of the maternal blood during pregnancy is less than that during the puerperium and greater than that of the cord blood.

Women whose pregnancy was complicated by protracted nausea and vomiting showed amounts of blood sugar which were consistently higher than those of women who did not have these complications. Rowley concludes that muscular work is not a factor in the production of postpartum hyperglycæmia; that ether anæsthesia is a contributing, but not necessarily a determining factor in the production of a rise in the blood-sugar concentration of cord blood (in the experiments reported every effort was made to minimize the effect of anæsthesia); and that it is impossible to show that involution of the uterus is a primary factor in producing postpartum hyperglycæmia. In certain types of toxæmia the blood sugar is increased.

Welz, W. E., and Van Nest, A. E.: The Sugar Test in Pregnancy. *Am. J. Obst. & Gynec.*, 1923, v, 33.

When first seen, the patient is told to come to the clinic the next morning without breakfast. She is then catheterized and the urine examined. If the urine is normal the test is continued, and a specimen of blood is taken for chemical examination. When this has been done, the patient is given 150 gm. of glucose dissolved in 500 c. cm. of tea and kept in the prone position for forty-five minutes to prevent vomiting.

Forty-five minutes, one hour, and one and one-half hours after the ingestion of the sugar a catheterized specimen of urine is again examined for sugar. Blood for a second sugar examination is usually taken between the one hour and the one and one-half hour periods.

Blood-sugar determinations are made by the Folin method, and urine-sugar determinations by means of Benedict's and Fehling's solutions. The content of sugar in the urine is usually between 0.2 and 1.5 per cent. Most of the positive cases will give a positive urine in forty-five minutes, but in some the test will not be positive before an hour or an hour and a half. Since adding the examination at the end of one hour and a half, the authors have found four cases which did not give positive reactions until the last specimen was obtained.

Welz and Van Nest believe that a spontaneous or artificially induced renal glycosuria with a blood-sugar content below 0.19 per cent in the first twelve weeks after conception is a valuable aid in the early diagnosis of pregnancy. The test has proved correct in more than 95 per cent of their cases.

E. L. Cornell, M.D.

Hinton, W. A.: The Wassermann Reaction in Pregnancy. *Am. J. Syphilis*, 1923, vii, 135.

This is a study of the Wassermann reaction of the blood of 10,427 pregnant women. The tests were made during the period from June, 1915, to June, 1919, and formed a part of the routine examination of these women. The purpose of the article is to draw attention to the efficiency of cholesterinized antigens in the Wassermann reaction in pregnancy and to give some idea of the prevalence of syphilis among women of the dispensary class.

The results obtained in this study should be compared with those which were obtained by the same technique in a group of 3,701 naval students and a penal group of 864 women (Table I).

These figures, which are from a highly syphilitic and an essentially non-syphilitic aggregate, are given to point out the comparative prevalence of the disease in well-defined groups as shown by the Wassermann test performed with the same uniform technique.

Table II gives the figures for the entire group.

The percentages of positive and doubtful reactions in the first two institutions are quite different from those in the last two. The results for the New England Hospital can be explained easily by the manner of obtaining the specimens, and agree with the observation of others that "cord blood" is only about one-third as effective in the detection of syphilis by the Wassermann test as blood obtained by the usual venous puncture. The table indicates also a low incidence of positive reactions in the cases of the Lowell Corporation which is accounted for by the fact that, roughly, 80 per cent of the patients are of foreign birth or descent. The figures from the Florence Crittenton Home are particularly interesting inasmuch as only young, unmarried

TABLE I.—WASSERMANN TESTS OF AVIATION STUDENTS AND REFORMATORY WOMEN

	Total	Positive		Doubtful		Negative	
		No.	Per cent	No.	Per cent	No.	Per cent
U. S. naval aviation students	3791	21	0 56	19	0 51	3661	98 92
Inmates of Massachusetts Reformatory for Women	862	349	40 49	73	8 7	438	50 81

TABLE II.—WASSERMANN RESULTS IN 10,427 CASES OF PREGNANCY

	Total	Positive		Doubtful		Negative	
		No.	Per cent	No.	Per cent	No.	Per cent
Boston Lying In Hospital	7121	372	5 24	353	4 95	6396	89 7
Florence Crittenton Home	264	11	5 6	16	5 97	237	88 6
Lowell Corporation Hospital	370	9	2 43	5	1 35	356	96 2
New England Hospital	2672	41	1 57	31	1 12	2600	97 5
Totals	10427	433	4 18	405	3 85	9589	91 9

TABLE III.—WASSERMANN REACTION BY RACE GROUPS

	Total	Positive		Doubtful		Negative	
		No.	Per cent	No.	Per cent	No.	Per cent
American	1665	107	6 42	78	4 68	1480	88 9
Russian	1566	44	2 81	56	3 58	1466	93 7
Jewish	561	14	2 49	27	4 71	520	92 6
Italian	868	33	3 8	41	4 72	794	91 4
Irish	501	19	3 79	20	3 00	462	92 9
Polish	313	7	2 25	10	3 22	296	95
Austrian	274	9	3 28	7	2 55	258	94 2
Syrian	191	12	6 28	12	6 28	167	87 3
Negro	276	92	33 3	7	2 54	177	64 1
Greek	330	3	91	7	2 12	320	96 8
Canadian	193	11	5 7	7	3 62	175	90 7
English	113	6	5 3	2	1 77	105	93
French	91	..		3	3 28	88	96 6
Portuguese	65	4	6 16	4	6 16	57	87 7
German	54	..		2	3 7	52	96 3
Swedish	46	1	2 175	1	2 175	44	95 7
Scotch	34	3	8 83	2	5 89	29	85 3
Miscellaneous	153	14	9 14	8	5 23	131	85 3
	7304	379		294		6621	

[1] These are almost all Russian or Polish Jews.

[2] Consisting of Finns, Turks, Nova Scotians, Danes, Swiss, Lithuanians, Norwegians, Roumanians, Hungarians, Prince Edward Islanders, West Indians, Porto Ricans, Newfoundlanders, Dutch, Servians, Bulgarians, Chinese, Belgians, Arabs, Albanians, Spanish, Japanese, Cape de Verde Islanders, Algerians, Cubans, Galesians, Persians, Egyptians.

TABLE IV.—WASSERMANN RESULTS CLASSIFIED ACCORDING TO AGE GROUPS

Ages Years	Total	Positive		Doubtful		Negative	
		No.	Per cent	No.	Per cent	No.	Per cent
12–17	110	1	0 91	5	4 54	104	94 6
17–22	1262	72	5 21	71	5 13	1119	88 7
22–27	2889	130	4 50	78	2 70	2681	93 8
27–32	1505	65	4 34	71	4 73	1389	92 7
32–37	981	46	4 65	31	3 17	924	92 2
37–42	482	19	3 94	11	2 28	452	94 8
Over 42	163	3	1 83	..		160	97 5
	7392	336		267		6789	

women without evidence of gonorrhœa or syphilis are admitted for confinement. These, therefore, represent unsuspected cases of syphilis.

Information of the greatest value was obtained by dividing the patients into racial groups. The classification used was based on the nativity of parents except as regards racial distinctions universally recognized, as illustrated by the Jews, Chinese, Japanese, and Negroes. This classification is employed by the U. S. Bureau of Statistics in classifying immigrants.

Although the number of cases in some of the groups is relatively small, it is evident that there is a lower rate of positive reactions among the

foreign population. The one exception lies with the Syrians who show about the same percentage as the white persons born in the United States and Canada.

An analysis by age groups is given in Table IV.

The most important fact to be learned from this table is that congenital syphilis must play a very small part in maternity. If we assume that the single positive case among the 110 patients ranging in age from 12 to 17 years was a case of congenital syphilis, the incidence is less than 1 per cent. This is greatly below that of the five groups over 17 years of age who constitute the majority.

Since pregnancy is a natural physiological function, few if any of these women sought medical attention because of acute or chronic illness. It was found that persons of greater intelligence show a uniformly lower incidence of positive tests, while those of lesser mentality show a higher rate. This difference is realized on comparing the 3,701 naval aviation students, among whom the positive reactions equalled only 0.5 per cent, with the group of criminal women who were for the most part feeble-minded and among whom the incidence of positive reactions was 40.1 per cent.

The conclusions drawn are as follows:

1. The statistics in this paper should indicate the prevalence of syphilis among the average women of Massachusetts of the dispensary class.

2. If we consider a positive reaction as diagnostic of syphilis, as in 4.18 per cent of these cases, and a doubtful reaction as indicative of inadequately treated syphilis, as in 3.85 per cent, the total incidence of the disease in this class is 8.03 per cent.

3. Properly standardized cholesterinized antigens have yielded a negligible number of false positive reactions in child-bearing women.

C. H. Davis, M.D.

Killgore, A. R.: Tumors of the Breast Arising During Pregnancy and Lactation. *California State J. M.*, 1923, xxi, 15.

This article is based upon a series of 1,500 cases of breast lesions. The material studied was the laboratory records of Bloodgood at the Johns Hopkins Hospital and a number of records from the University of California Hospital.

The most common of all breast tumors appearing during pregnancy and lactation as well as at other times is cancer. The order of frequency of certain benign conditions changes materially during activity of the breast. Nearly 70 per cent of galactoceles, or milk cysts, arise in connection with breast activity. In over 25 per cent of cases of breast tuberculosis the condition develops during pregnancy or lactation—no doubt because of the lighting up of unrecognized foci in the breast by the increased circulation incident to function. In order of frequency, the most common tumors developing during pregnancy and lactation are cancer, galactocele, tuberculosis, and adenomata. These constitute over 90 per cent of tumors appearing at these periods. At other times than during functional activity, chronic cystic mastitis in its tumor-like forms takes the place of galactocele and tuberculosis in frequency.

The incidence of both cancer and benign tumors is distributed fairly evenly over the various stages of pregnancy and lactation. The point of practical importance in this connection is that at no time during pregnancy or lactation can cancer be ruled out in the differential diagnosis. During the early months of lactation most lumps in the breast are inflammatory, but in the series of cases reviewed 20 per cent of pregnancy and lactation cancers were first noted during the first four months of lactation. Therefore it is not safe to delay the exploration of a lump during early lactation too long on the assumption that it is inflammatory.

Most interesting of all aspects of this subject is the question of the relation of breast activity to cancer. It is fairly well established that previous

Table I.—Percentage of Tumors Arising During Pregnancy or Lactation

		Arising at any time No.	Arising during course of pregnancy or lactation Per cent
Cancer	1,500	49	4.44
Cancer (only patients under 47 years)	493	49	10.
Galactocele	19	13	68.4
Tuberculosis	34	9	26.4
Adenofibroma	265	9	3.4
Miscellaneous	74	6	0.
Totals	1,911	86	4.7

Table II.—Expected and Actual Incidence of Cancer in Lactation in the Registration Area

Age group	Expected incidence (if mammary activity remained the same as at other times)	Actual incidence (estimated from figures of series reported)
25–29	9.0	15
30–34	16.9	47
35–39	34.9	35
40–44	20.9	75
45–49	3.4	20

Table III.—Comparison of Increase with Advancing Age of Cancer in Lactation and at Other Times

Age group	Total breast cancers per 100,000 females in each age group	Lactation cancer per 100,000 pregnant and lactating women in each age group
25–29	1.7	3
30–34	4.4	21
35–39	14.3	14.3
40–44	25.	93
45–49	43	110

normal lactation does not render a woman more apt to develop breast cancer in later life than the woman who has never lactated, but it is not so clear whether cancer is more apt to develop during a year and a half of pregnancy and lactation than it is during the same length of time at the same age when the breast function is dormant.

Of forty-five patients traced for five years or longer after operation, six (13 per cent) were well when last heard from. This percentage of five-year cures is not as high as the percentage of cures in unselected cases of breast cancer generally, but indicates, as cancer statistics go, a far from hopeless prognosis for malignant disease arising in connection with breast activity. C. H. Davis, M.D.

McNalley, F. P., and Dieckmann, W. J.: Hæmorrhagic Lesions of the Placenta and Their Relation to White Infarct Formation. *Am. J. Obst. & Gynec.*, 1923, v, 55.

In an examination of 320 placentæ at or near full term the authors were struck with the frequency of hæmorrhagic lesions, which were noted in 123 cases (38 per cent).

On the basis of this study they draw the following conclusions:

1. At least some of the usual white infarcts resulting from changes in the villi may at first be red in color, as described by Young. To these, the term "red infarct" is applicable.

2. The other lesions, to which various terms have been applied, should not be called "red infarcts" because they are not infarcts, being collections of blood to which the term "hæmatoma" or "hepatization" is applicable, depending on whether they are circumscribed or diffuse. They have a common etiology.

3. As pointed out by Young, the maternal blood is of primary importance in nourishing the villi.

4. Collections of blood in the placenta may be the beginning of white infarcts. This blood itself may be changed into white infarct, which in the gross does not differ from any other, or the collections may cause infarction of the surrounding villi by interfering with the maternal circulation.

5. There can be white infarct formation without endarteritis in the fetal vessels. Whether this is true of all infarcts it is impossible to say at the present time. E. L. Cornell, M.D.

Cotte, G.: The Etiology and Treatment of Tubal Pregnancy (Sur l'étiologie et le traitment des grossesses tubaires). *Lyon chir.*, 1922, xix, 665.

The author's patient had a normal pregnancy when she was 27 years old. Three years later she was operated upon for what was thought to be acute appendicitis but found to be an extra-uterine pregnancy. The illness reported in this article suggested a second tubal pregnancy but this was ruled out. A diagnosis of salpingitis was made and vaccine treatment given. Several days later the patient passed a large amount of black blood by rectum which undoubtedly was from a hæmotocele opening spontaneously. About six weeks later a hæmatosalpinx the size of a mandarin orange was removed by operation. Recovery followed.

Extra-uterine pregnancy with a hæmatocele opening spontaneously into the vagina or rectum is a rare condition today because operation is usually performed before this stage is reached.

Cotte suggests that as women who have had one tubal pregnancy are apt to have another, it might be well to perform a hysterectomy or remove the opposite tube at the time of the first ectopic gestation. If the other tube shows severe inflammation there is no question as to this indication, but in one case in which the remaining tube was apparently normal Cotte did a salpingostomy.

It has not been proved that the cause of tubal pregnancy is a congenital malformation.

On the basis of the literature and nineteen cases of his own, Cotte believes that in tubal pregnancy the treatment should be salpingectomy or salpingostomy alone without removal of the ovary, and that in a certain number of cases the gravid tube may be saved. If the tubal abortion has been complete and the pavillion remains permeable it is probable that the swollen tube will regain its normal size and again fulfil its function.

W. A. Brennan.

Moody, W. B.: Bacteriology of Fatal Systemic Infections Following Miscarriage or Abortion. *Am. J. Obst. & Gynec.*, 1923, v, 78.

In twenty-four of twenty-eight cases studied some one organism appeared in several of the fluids; thus beta streptococci were isolated from more than one place in thirteen, pneumococcus, bacillus coli, and staphylococcus in three each, and bacillus mucosus and alpha streptococcus in one each. Cultures were made during life from the blood of five patients. In only one were any organisms found; these were beta streptococci. In these cases there was thrombo-ulcerative endocarditis. The hæmolytic streptococci isolated in all instances proved to be of the beta type. All fermented lactose and salicin but not mannite or inulin; efforts to determine a specific strain by agglutination tests failed. Agglutination of suspensions of these strains by serum from rabbits injected with strains of hæmolytic streptococcus from several sources such as cases of scarlet fever, erysipelas, infected tonsils, and sepsis due to abortion, failed to show any specific characteristic group.

Although it was noticed at autopsy that as a rule the alterations consisted of peritonitis or thrombophlebitis varying in location, degree, and sequence—also that these two types of alterations were rarely combined—no difference in the bacteriology corresponding to the two types of alterations was definitely established.

Statements, particularly negative statements, made by women who have had a criminal or self-induced abortion, are entirely unreliable. Admis-

sions that pregnancy was interrupted by a midwife, a physician, or the patient herself were obtained from thirteen patients. In four patients, hæmolytic streptococci were found; in seven, staphylococci or bacillus coli; in one, the pneumococcus; and in one, the proteus bacillus. In three of the four cases in which beta streptococci were found it was stated that a physician or midwife had introduced balloons or performed curettage. The fourth patient stated that she had inserted a stick, and it was later found that the uterus was perforated. Patients with sepsis associated with such organisms as bacillus coli or staphylococci or bacillus proteus were apparently treated under conditions far from aseptic and by the repeated introduction of instruments into the uterus.

One patient aborted four days before she entered the hospital and lived only two days after her admission. At autopsy, gangrenous endometritis, acute serofibrinous peritonitis, bilateral pleuritis, and pyosalpinx were found. The blood from the heart and the peritoneal, pericardial, pleural, and cerebrospinal fluids yielded a pure culture of hæmolytic streptococci.

Two patients denied instrumentation of the uterus, but stated that they had taken pills and used repeated douches to terminate pregnancy. Both were ill about three weeks with cramps, chills, and fever. At autopsy, gangrenous endometritis, fibrinopurulent peritonitis, and perimetritis were found. In one instance there was, in addition, suppurative thrombophlebitis of the right iliac vein with infarcts in the spleen and one lung. Cultures of the blood and the pleural and peritoneal fluids showed beta streptococci.

Another patient, who had been attended by a midwife and doctor on a number of occasions, later developed chills, fever, sweats, and swelling of the left leg, with beginning gangrene. After death, a purulent endometritis, abscess in the myometrium and thrombosis of the uterine, ovarian, renal, iliac, and femoral veins and the inferior vena cava were found. Staphylococci and bacillus coli were isolated from the blood in the heart and the inferior vena cava, but no organisms were isolated from the peritoneal fluid.

E. L. Cornell, M.D

LABOR AND ITS COMPLICATIONS

Telfair, J. H.: Separation of the Symphysis Pubis During Labor. *Am. J. Obst. & Gynec.*, 1923, v. 91.

Three cases of separation of the symphysis pubis during labor are reported.

Case 1. The patient was a 26-year-old para-i who was admitted to the hospital December 19, 1921, at term. All pelvic measurements were normal. Presentation and position: vertex, left occipito-anterior. The first stage of labor lasted sixty-two hours and the second stage one and one-half hours. Labor was terminated by high forceps delivery. During the extraction, when the head was in the mid-pelvis, the operator felt a sudden "give," after which extraction was easy. The baby weighed 4,560 gm. There was profuse bleeding from the anterior wall and upon examination it was found that the entire anterior vaginal wall, urethra, and labia were separated from the ramus pubi on the left side. After introducing a catheter into the meatus, clear urine was obtained, a fact indicating that there had been no injury to the bladder. There was separation of the pelvic bones amounting to about 3 cm. A retention catheter was inserted and the lacerations were repaired. A 6-in. adhesive plaster strap was applied over the trochanters, completely surrounding the pelvis. Shock was moderate. The patient responded well. Two days after delivery a profuse, purulent discharge issued from the space of Retzius. The sacro-iliac joints showed no disturbance. Convalescence was mildly septic. Fibrous union developed at the symphysis and the patient was discharged from the hospital in four weeks, walking without difficulty.

Case 2. The patient was a 26-year-old para-iv who had had three full-term normal deliveries. At term she weighed 95 lbs. The pelvic measurements were normal. Presentation was left occipito-anterior. The labor progressed rapidly with strong pains. After delivery the patient showed moderate shock. The baby weighed 5,280 gm. Separation of the symphysis was suspected on examination and shown by the X-ray. There was no laceration. The usual adhesive straps were applied. The patient made an uneventful recovery, leaving the hospital on the sixteenth day, when she was able to walk without difficulty.

Case 3. The patient was a 24-year-old para-i who was admitted to the hospital immediately after she had been delivered at home by forceps. The baby weighed 4,560 gm. The patient entered the hospital still under the influence of ether and with the vagina packed to control hæmorrhage. Moderate shock was present; the pulse was 136. The following day when the packing was removed it was found that the anterior vaginal wall and urethra were torn from the pubic bones, the laceration extending into the prevesical space. The pubic joint was ruptured and the ends of the bones separated 10 cm. A permanent catheter was introduced and the oozing wound packed to control hæmorrhage. The pelvis was strapped in the usual manner, the pubic bones being brought into apposition.

The next day the temperature was 103 degrees F. and the pulse 140. Pain and tenderness were present in the lower abdomen and there was marked distention. The patient ran a severe septic course for three weeks but left the hospital at the end of five weeks, walking without pain or difficulty.

E. L. Cornell, M.D

Shoemaker, J. A.: Double Uterus: Cæsarean Section for the Delivery of a Pregnant Right Uterus at Term. *J. Am. M. Ass.*, 1923, lxxx, 1179.

The author reports the case of a young woman with a double uterus, double cervix, and fibrous

vaginal septum, who became pregnant in the left uterus soon after marriage, miscarried at two months became pregnant in the right uterus about four months later, and was delivered at term by cæsarean section of a female infant weighing 5 lbs. 10 oz. At operation two distinct uteri joined only at the cervical portion were found. Connected with the lateral side of each uterus was an apparently normal tube with a normal ovary. The consultant who performed the cæsarean section sterilized the patient by resecting the tubes, but the reason for this is not stated. C. H. Davis, M.D.

Greenhill, J. P.: "Once a Cæsarean Section, Always a Cæsarean Section," an Untruth. *Am. J. Obst. & Gynec.*, 1923, v, 85.

Four cases are reported in which cæsarean section had been performed at the first pregnancy. It was noted that in every instance the baby born through the vaginal route weighed more than the baby delivered by cæsarean section. One patient was delivered by forceps (prophylactic) and three gave birth spontaneously. In the cases in which the classic cæsarean section had been done a relatively thin scar was found, whereas in the patient on whom the low cervical operation had been performed no trace of the scar was palpable. In the three cæsarean sections performed at the Chicago Lying-in Hospital catgut was used in closing the uterus.

It appears from this report that, in view of the modern methods of performing cæsarean section, the dictum, "once a cæsarean section, always a cæsarean section" is untenable.

E. L. Cornell, M.D.

NEW-BORN

Holland, E.: Cranial Stress in the Fetus During Labor, and the Effects of Excessive Stress on the Intracranial Contents. *J. Obst. & Gynæc. Brit. Emp.*, 1922, xxix, 551.

During molding of the head in labor the cranial septa tend to restrict the change in shape to certain limits. In compression shortening the anteroposterior diameter, the middle portion of the free edge of the falx cerebri and the tentorium cerebelli are stretched and tense. When the vertex to base diameter is shortened, as in face or brow presentations, the free border of the tentorium and the lower third of the falx are stretched and the rest of the falx is slack. As the large veins are in the specially thickened portion of the septa along their attachments to the periostium and their free borders, the tearing of the falx or the tentorium is apt to be associated with subdural or deeper hæmorrhage. Of 167 fresh fetuses examined, the tentorium cerebelli was found torn in eighty-one. In five, there was also a tear in the falx cerebri. In all but six, subdural hæmorrhage occurred.

In forty-six of these cases the presentation was cephalic, and in thirty-five a breech presentation. Of the forty-six cephalic presentations forty-four



A complete bilateral tear of the tentorium cerebelli. On the right side the anterior vertical basal has been torn through, on the left side the anterior border of the band remains intact.

were vertex presentations and one was a brow presentation. In twenty-five cases of vertex presentation forceps were used, and in nineteen delivery was spontaneous. In some of the cases of breech presentation version was necessary; some of the deliveries were easy while others were difficult.

R. E. Christie, M.D.

McDonald, A. L.: Repeated Dystocia from Fetal Anomaly in Successive Pregnancies. *Am. J. Obst. & Gynec.*, 1923, v, 83.

The patient, a woman 28 years of age, was delivered in the seventh month of pregnancy. The child presented by the breech. The fetal abdomen was markedly distended by several quarts of fluid. Upon release of the fluid the child was delivered easily.

The baby was stillborn. Its length was 15 in., its head small and of the hydrocephalic type, and its thorax well formed. The abdomen had been apparently greatly distended, and its walls were thin. The lower part of the abdominal cavity and pelvis were somewhat mutilated in the extraction. The external genitals were so mutilated that it was impossible to determine the sex of the child. The legs were well formed but the feet were clubbed and each foot had six toes. The hands were normal except that there were six digits and one of these on each hand was double (fused).

The liver was of normal size but located in the left hypochondrium, as were also the gall-bladder and ducts, the cæcum, and the appendix. The small and large intestines were apparently normal in structure. The sigmoid and rectum were on the

right side. In the lower abdomen a large mass extended from the symphysis to the umbilicus. The kidneys were normal in size and position. The ureters were enlarged and entered the mass described. When opened, this mass proved to be the bladder with thickened walls. The cavity could be followed above the umbilicus, where there was a large patent urachus. On each side of the mass small structures, apparently the ovary and tube, were found. No uterus could be demonstrated. Examination of the thorax demonstrated apparently complete situs transversus. The placenta was normal in gross structure. Section showed the villi to be normal or only slightly thickened.

On July 25, 1921, this woman was delivered spontaneously of a stillborn overterm fetus which presented exactly the same anomalies as the first.

E. L. Cornell, M.D.

Crothers, B.: Injury of the Spinal Cord in Breech Extraction as an Important Cause of Fetal Death and of Paraplegia in Childhood. *Am. J. M. Sc.*, 1923, clxv, 94.

The author states that lesions of the spinal cord due to breech extraction are usually discovered by the pathologist. Direct suprapubic pressure upon the head by an assistant during extraction or the usual delivery of the breech is often a very important factor in the production of intracranial and high cord lesions.

Five cases are reported in which crippling was due to spinal cord injuries caused apparently by breech extraction. Four of these showed definite evidence of practically complete transection.

The author draws the following conclusions:

1. High cervical transections are probably all fatal on account of the proximity of the lesion to the phrenic nerves and the medulla.

2. Transections below the fatal level, if accompanied by sufficient hæmorrhage to destroy the cells of the lower segments, result in anæsthesia and permanent flaccidity below the lesion.

3. Transections confined to a few segments and not involving the lumbar enlargement result in anæsthesia associated first with flaccid paralysis and after a few days or weeks with a zone of flaccidity corresponding to the destroyed cells of the anterior horn, and below this zone, reflex activity of distinctive type. During this stage the bladder and rectum become "automatic." On theoretical grounds it seems probable that this stage of reflex activity will last only so long as severe infection is prevented.

4. It is evident that the vast majority of obstetrical spinal cord injuries are caused by manœuvres incident to breech extraction.

5. From a theoretical consideration of the forces at work in extraction it seems justifiable to suggest that traction on the cord, when combined with suprapubic pressure or uterine contractions on the head, may cause collapse or death from herniation of the medulla through the foramen magna.

6. If this possibility can be proved by laboratory or clinical studies, it will be proper to challenge the statement, now almost universally accepted, that asphyxia is the only important cause of fetal death in breech extraction.

H. B. Matthews, M.D.

Bacon, C. S.: Some Obstetrical Problems Involved in Stillbirths and Deaths of Newborn Infants. *J. Iowa State M. Soc.*, 1923, xiii, 14.

The number of stillbirths in the United States is about 4 per cent of the number of births, and the number of deaths in the first two weeks of life is about 3.5 per cent of the number of births. In other words, it is estimated that there are about 100,000 stillbirths in the United States every year and about 87,000 deaths of infants less than two weeks old. In Iowa there are 2,400 stillbirths and 2,100 infant deaths.

The cost of a child at birth is much greater today than it was twenty or thirty years ago. Computing the time lost by the mother at current wage rates and considering the expenditures for nursing and medical attendance, it is estimated that the cost of a baby in a family of average circumstances is $500. With the decline in the birth rate and death rate and with a 10 per cent increase in the expectation of life at birth, from forty-six to fifty-one years, babies are worth considerably more than they were twenty years ago and responsibility for their safe delivery is correspondingly increased.

Fetal deaths may occur antepartum or intrapartum. The most important causes of antepartum deaths are syphilis and toxæmia injuring the placenta. The majority of intrapartum fetal deaths are due to disturbances of placental circulation caused by excessive contractions of the uterus or to separation of the placenta. A few are due to obstruction in the cord. Some result from injuries to the brain and spinal cord, and perhaps a few from poisoning by analgesics or anæsthetics.

On account of the great importance of excessive uterine contraction in causing stillbirths, labor should be watched carefully, especially during the second stage. Probably one-fourth of all stillbirths and one-fourth of all deaths occurring during the first two weeks of life could be prevented by proper management of labor consisting in careful watching of the uterine forces, the control of excessive contractions, prompt interference when indicated, and the avoidance of all unnecessary and improper operations.

Excessive contractions of the uterus may arise spontaneously as a reaction to obstructed labor or may be caused by the use of oxytocics or manipulation. The author has known of several infant deaths each year which were due to improper use of pituitary extract. He reports that he has never lost a child from the use of morphine and scopolamine as an analgesic during the first stage of labor. Neither has there been any fetal death in his cases which could be attributed to the use of ether or nitrous-oxide and oxygen.

C. H. Davis, M.D.

Groves, W. R.: Hæmorrhage in the Newly Born.
Med. J. Australia, 1922, ii, 702.

The author reports a case of hæmorrhage from the navel and penis of a newborn infant which could not be stopped by ligation or local applications. After forty-eight hours the child's condition was so grave that the injection of 9 c.cm. of the father's blood into the longitudinal sinus was done. The oozing then promptly ceased. The technique used is described as follows:

Sterilize two syringes (one with a capacity of 10 c.cm.) which have interchangeable needles. The latter must be stout (about the thickness of an average-sized safety pin at least). A warm sterile saline solution and a 2 per cent sodium citrate solution are necessary. For the latter, a solution of sodium citrate tablets in sterile water may be used without further sterilization. Take up 1 c.cm. of this citrate solution in the 10 c.cm. syringe and an unmeasured quantity in the second syringe, and place both in warm saline or preferably citrate solution in a sterile dish (in the latter case no saline solution need be prepared). Into the 10 c.cm. syringe take up 9 c.cm. of blood from the vein of the donor. This gives a dilution of a little over 0.2 per cent. Disconnect the needle and lay the syringe in the warm sterile citrate solution. Then place the baby on its back across a table, with the occiput resting at the edge. The head should be steadied during the operation by a nurse leaning across the child's body and placing her hands at the sides of the head. Sterilize the area about the anterior fontanelle (shaving is not necessary) and define the posterior angle of the fontanelle with the left forefinger. Insert the needle of the second syringe exactly in the midline and direct it obliquely downward and forward at the spot located by the left forefinger. After it passes through the scalp a second and very appreciable resistance will be felt. In overcoming this the needle slips into the sinus, the entry being signalled by a thin stream of blood mixing with the citrate solution in the barrel of the syringe. Care is necessary to keep the needle from moving. Disconnect the barrel of the syringe, replace it by the 10 c.cm. syringe, and very slowly deliver the citrated blood into the sinus. Unless the needles are of large gauge, an appreciable amount of force will be necessary to empty the syringe, but as long as the baby's head and the syringe have not been moved, the surgeon can be sure that the needle is still in the sinus and can inject with confidence.

C. H. Davis, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Stevens, W. E.: Malignant Tumors of the Suprarenal Gland. *J. Am. M. Ass.*, 1925, lxxv, 171

Stevens reports the case of a boy 13 years of age who died from hypernephroma twenty-two months after the beginning of symptoms. There seemed to be a definite relationship between the development of the tumor and trauma as severe pain first occurred in the left upper quadrant of the abdomen two hours after the lifting of a heavy trunk. Operation showed a retroperitoneal hæmatoma. Subsequently the pain recurred at intervals, the region of the left kidney became tender, and a mass became palpable in front below the ribs. The blood pressure rose to 175 and 120. Indigocarmine injected intravenously did not appear from the left ureter in seventeen minutes. The patient complained of a chilly sensation, night sweats, anorexia, indigestion, and vertigo, and developed a brownish pigmentation of the face and a diffuse mottling over the entire body.

The author reviews seventy cases. The first symptom was weakness. This was followed by loss of appetite, vomiting, diarrhœa, and pain from pressure. The average age of the patients was 32½ years. In most cases, the tumor was fatal much sooner than in the author's case.

The only hope of recovery depends on early diagnosis and removal of the tumor before metastasis occurs. Roentgen-ray and radium treatment should be given before and after the operation.

B. F. Keller, M.D.

Harrison, G. A., and Lawrence, R. D.: Diastase in the Blood and Urine as a Measure of Renal Efficiency. *Lancet*, 1925, ccix, 169

The concentration of urinary diastase has been wisely used as a test of pancreatic and renal efficiency. Comparatively few investigators, however, have estimated the blood diastase, and even fewer have determined the values for blood and urine simultaneously.

The authors found estimations of diastase in both the blood and the urine of value in the confirmation of other renal efficiency tests, and state that reliance should never be placed on an estimation made on the urine alone.

The conclusions drawn are summarized briefly as follows:

1. It is immaterial whether serum or plasma is used for the estimation of blood amylase.

2. The concentration of the enzyme in the blood remains constant throughout the day.

3. Normally, the values for the blood lie between 5 and 10 units.

4. It is necessary to demonstrate retention of diastase in the blood before concluding that disease of the kidneys is responsible for a decrease in the excretion of the ferment.

5. Diastase estimations have been found useful in the confirmation of other renal efficiency tests, but only in severe cases. Louis Gross, M.D.

Sutton, M. G.: The Action of Hexamethylene-Tetramine. *Med. J. Australia*, 1925, i, 31

The following article is a discussion of the method of using potassium citrate with "hexamine" in pyelitis.

In true bacillus-coli infection the urine has an acidity of approximately $p H_5$ never more. This is due to the fact that the bacillus produces an acid and does not split up urea, and the fact that in the acute fulminating type of pyelitis there is an associated acidosis. The para-colon group alkalinize litmus milk and are therefore found in slightly acid or neutral urine. In mixed infections, especially those with obstruction, urea is split.

The antiseptic value of hexamine is due to the fact that in an acid medium it is split up into formaldehyde and ammonia. The normal acidity of a 24-hour urine is $p H_6$. An acidity of $p H_5$ is needed to inhibit growth completely, but an acidity as low as $p H_6$ will retard it. The alkaline inhibition point for bacillus coli is $p H_{8.6}$ to $p H_{9.4}$, but the injection of alkali will not produce urine more alkaline than $p H_{8.6}$ or $p H_{8.7}$. Its beneficial results may be diuresis or the neutralization of toxins.

A 1:5,000 solution of formalin will inhibit the growth of bacillus coli communis in thirty minutes. Therefore infections higher than the bladder are not influenced by it.

Alkalies combat acidosis, but rarely inhibit the growth of bacillus coli communis. Alkalies may be given before hexamine to neutralize the gastric juice temporarily, but acid sodium phosphate should be given with it. Hexamine is given before meals to evade the "acid tide" of the stomach and the "alkaline tide" of the urine. Fluid should be restricted.

Hexamine is valueless in cases of urinary frequency or bladder fistula and when an indwelling catheter is used. It is of doubtful value in lesions higher up or in the urethra. C. D. Pickrell, M.D.

Fullerton, A.: Unilateral Diuresis. *Surg., Gynec. & Obst.*, 1923, xxxvi, 16

The author reviews the various theories regarding urinary secretion and classifies diuresis as active or acute, the type seen in hysterical or nervous persons, and passive or chronic, that due to obstructive conditions of the urinary outlet such as prostatic enlargement.

The purpose of this article is to establish the importance of diminished specific gravity of the urine from one kidney as a sign of disease of that kidney or disturbance of its function. The author's observations are based on 448 cases. In this series were 117 patients in whom all the evidence of careful cystoscopy was against a renal origin of their complaint. In 111 of the 117 cases the specific gravity was equal on the two sides. The remaining six are ruled out as the author believes that in these cases there had been a previous kidney disorder. The specific gravity was equal on the two sides also in ten cases of bilateral nephritis and twenty-one of twenty-six cases of bilateral pyelitis. In the remaining cases the severity of the condition as shown by the amount of pus and albumin was greater on the side of the lower specific gravity.

These facts show that a difference in specific gravity on the two sides indicates some abnormal condition on one side, or, if both kidneys are diseased, an inequality in the extent of the involvement on the two sides. A lowered specific gravity was found on the affected side in cases of renal calculus, tuberculosis of the kidney, tumor of the kidney, unilateral pyelitis, hydronephrosis, polycystic disease of the kidney, movable kidney, renal colic, renal infarcts, gunshot wounds of the kidney, and certain cases of symptomless renal hæmaturia.

H. W. Plaggemeyer, M.D.

Lowsley, O. S., and Muller, H. R.: An Experimental Study of Various Chemicals Used in Pyelography. *J. Urol.*, 1923, ix, 1.

The authors confirm the work of Eisendrath who found that injecting any material into the kidney pelvis under pressure sufficient to cause overdistention is a dangerous procedure, leading to an inflammatory reaction in the kidneys, pulmonary embolism, œdema, and death. They note that 30 per cent ammonium bromide and 20 per cent sodium iodide cast as deep shadows as bismuth nitrate in suspension, and that potassium iodide gives the most distinct shadows of all. Sodium iodide is as opaque as sodium bromide or a 15 per cent thorium nitrate solution, less toxic than either, of lower viscosity, less hypertonic, and therefore less harmful. It is now used in 20 per cent solution.

Pyelography is indicated to ascertain the extent of damage ot the pelvis, the degree of dilatation, the exact location of a stone, and the presence of hydronephrosis, malignant growths, malformations, strictures, or anomalies.

The principal contra-indications are a subacute infection, deficiency of the kidneys, old age, and great weakness.

The authors insert lead catheters through a cystoscope, take specimens for laboratory examination, and make the efficiency tests first. They then make roentgenograms of the upper and lower tracts. Sodium iodide solution is then injected and new roentgenograms are made. A fifth roentgenogram is made with the patient in the erect position, the catheters having been withdrawn to the ureteral orifices and sodium iodide injected during their withdrawal. The sodium iodide is drawn off by reinserting the catheters. For cystograms silver iodide emulsion has been found a satisfactory medium. Both kidneys may be examined at once by this method.

B. F. Roller, M.D.

Quinby, W. C.: Perirenal Insufflation of Oxygen. *J. Urol.*, 1923, ix, 13.

The most reliable of recent reports are not enthusiastic regarding the perirenal insufflation of oxygen, and the author finds that this procedure does not give plates of any greater value than the stereoscopic plates made over the Bucky diaphragm. He believes there is little danger of mediastinal emphysema and penetration of the bowel if the operator has even ordinary judgment and knowledge of anatomy. Quinby used oxygen collected in a sterile liter flask connected with a 2-liter flask of sterile water, and a lumbar puncture needle marked in centimeters. The patient was placed on his side, and after the induction of local anæsthesia the needle was inserted into the loin, pointing up and in toward the lower pole of the kidney, through the perirenal fascia but not into the kidney, to a depth of 2½ to 10 cm. according to the patient. When the needle was in position the water flask was inverted. At an elevation of 2 ft. the water will displace the oxygen with moderate pressure. The best results were obtained by injecting the kidney pelvis and making an X-ray exposure from twelve to fourteen hours after the gas insufflation.

Dense adhesions about the kidney such as follow an operation are a definite contra-indication to the insufflation of gas.

B. F. Roller, M.D.

Braasch, W. F.: Renal Torsion. *J. Urol.*, 1923, ix, 53.

At times in the course of pyelography, abdominal exploration, or necropsy a marked deviation from the normal in the relative position of the renal pelvis and calices is found. The pelvis may lie anterior to the calices, or the normal relations may be reversed so that the calices are median to the laterally lying pelvis. This torsion may be due to an arrest of the renal mass in its progress upward while the pelvis is still anterior and before complete rotation has occurred. Renal torsion may be caused also by other than congenital factors such as acquired renal ptosis resulting from various factors, floating kidney being the most common. The long axis is often changed from the normal vertical so that the pelvis extends horizontally. Another responsible factor is displacement of the kidney by external pressure. This may be produced by an extrarenal tumor, perinephritis, and spinal deformity. In such cases the kidney may be markedly displaced. It is not unusual to find it over the vertebræ under the tenth or eleventh rib or in the bony pelvis. Intrarenal tumor may cause torsion through displacement or by encroaching on the pelvis. Renal rotation may result also from perinephritis and subsequent cica-

trical retraction. This accounts for the unusual position in which an infected kidney is found at operation.

The anteriorly rotated kidney may be felt on abdominal palpation, but generally the diagnosis is made only by means of pyelography. The calices may be outlined by round areas of accentuated density or may be observed extending distinctly median to the laterally lying pelvis. In cases of acquired renal ptosis a wide range of abnormal rotations of the pelvis may be observed. As a result of extrarenal pressure the pelvis may be displaced in any direction and abnormal rotation is not uncommon. This rotation from extrarenal factors is generally not so marked as that due to congenital anomalies and rarely causes urinary obstruction.

Mueller, A.: The Diagnosis and Surgical Treatment of Accessory Kidney (Zur Diagnose und Operation der akzessorischen Niere). *Ztschr. f. urol. Chir.*, 1922, ix, 141

Mueller reports the case of a man 28 years old whose condition had been variously diagnosed. Appendectomy had been advised, and an operation had been performed also for supposed inguinal hernia. Bladder symptoms finally led to a urological examination.

On the right side two ureteral orifices were found. With the aid of pyelography, chromocystoscopy, and ureteral catheterization, a diagnosis of double right kidney with non-function, pyelonephritis, and hydronephrosis of the lower portion was made. The left kidney was normal.

At operation the accessory organ was found attached to the lower pole of the right kidney but separated from it by a furrow. The accessory organ had a distinct vascular supply, and ureter, and a distended pelvis. It was resected in a wedge-shaped section.

Anatomically the specimen proved to be a hypoplastic kidney with subacute inflammation.

In the second case of double kidney observed by the author there was double hydronephrosis; the upper, accessory portion of the kidney had been entirely destroyed, while the lower portion showed only very small remnants of functioning parenchyma. There was no communication between the two organs. These findings indicated removal of the entire kidney and the dilated ureters.

The author reviews the literature on double formation of the kidney. The primary inferiority of the double organ and the frequent complication in the course of the ureters are responsible for the frequency with which the double organ becomes diseased (pyelitis, pyonephrosis, hydronephrosis). It is an interesting fact that tuberculosis is often restricted entirely to one portion, even when the duplication is not particularly marked, nevertheless, resection of only one-half of the kidney in cases of tuberculosis is not recommended.

Today, by means of pyelography and tests of function, the diagnosis of double kidney is possible, even as regards such details as forking of the ureter with only one outlet. In the presence of unexplained abdominal symptoms, the possibility of renal abnormalities should be borne in mind. In cases of slight pyelitis, conservative treatment may be considered, but when the condition is more severe, operation is indicated. When one-half of the double organ is normal it should be preserved if possible.

J[illegible] (Z.)

Stanton, E. M.: Renal Colic Associated with Urethral Conditions in Women. *Am. J. Obst. & Gynec.*, 1923, v, 72

A working hypothesis for the correlation of the symptoms and pathology in these cases may be stated as follows:

The patient is of the hypersensitive type. She develops a slight non-specific urethritis, not an uncommon disease in women, which sets up a more or less plastic condition of the urethra and favors the development of a trigonal cystitis. When the trigonal cystitis involves the region of the ureteral orifice, the ureter is sensitized so that on slight stimulation it develops the ureteral spasms which are the true cause of the renal colic. It is very possible that the renal colic begins with painful spasmodic contractions of the urethra following urination and that these contractures of the urethra are transmitted through the trigone to the ureter. At any rate, if the urethra is kept dilated, the trigonal cystitis, the urinary irritability, and the renal colic tend to disappear.

E. L. Cornell, M.D.

Eisendrath, D. N.: Renal Calculi. *Wisconsin M. J.*, 1923, xxi, 349.

Eisendrath discusses the formation and re-formation of calculi, the advances in the X-ray diagnosis of renal calculi and their differentiation from other conditions, the absence of a clinical picture pathognomonic of their presence, the importance of congenital anomalies of the kidney and ureter, the indications for operation, and the improvements in the methods of removing renal calculi.

Calculi occur in bacteria-free kidneys as well as those presenting an infection. Their formation is favored by obstruction to the outflow of urine from the kidney and by disturbance of the innervation of the organ as in spinal cord injury or disease. In aseptic kidneys the stones usually found are uric acid and oxalate calculi, while in infected kidneys calcium phosphate and carbonate stones are more common. The experiments of Rosenow and Meisser, in which stones were formed in the kidneys of dogs by injecting the animals with organisms isolated from a man suffering with recurrent calculus formation, made a very valuable contribution to our knowledge of stone formation. Many instances of so-called recurrences of calculi are cases of small stones overlooked at the first operation rather than cases of true re-formation.



Fig. 1. Areas to be included in roentgenogram of the urinary tract. The upper exposure should always show the last two ribs on each side, the bodies and transverse processes of the last two dorsal and first four lumbar vertebræ, the shadow of at least the lower two-thirds of the kidney, and the markings of the psoas muscle. The lower picture is taken in such a way as to overlap somewhat the upper one, and includes the entire pelvis and the last lumbar vertebra.

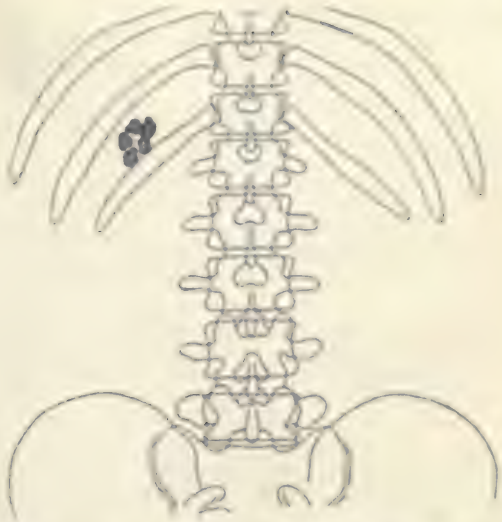


Fig. 2. Multiple gall-stone shadows. Note the characteristic facetted shadows, each one of which has a dark periphery and a lighter center.



Fig. 3. Tracing of X-ray from case showing simultaneous presence of a branching or coral-like calculus in the right kidney and gall-stones.

Pyelography and ureterography are often indispensable in the diagnosis of this condition when the X-ray study alone gives doubtful findings.

Eisendrath reviews the classical symptoms of calculus in the kidney and then points out how they may mislead. Other kidney conditions frequently cause exactly the same symptoms. The diagnosis of renal calculi should never be made hurriedly from the symptoms alone.

Congenital anomalies are responsible for many problems in the diagnosis. In such cases also the X-ray study combined with opaque injections is frequently of great value.

Operative intervention may or may not be urgent. It is urgent in cases of calculus anuria and calculus blocks. While some cases of this type can be relieved by ureteral catheterization, one should not wait longer than forty-eight hours for relief of the anuria. If then the stone cannot be located at operation, nephrotomy or pyelotomy should be done immediately, removal of the stone being delayed for a later time. The tendency towards conservation of an organ which still retains some functionating parenchyma is one of the important advances in modern urology. In the majority of cases of renal stone operation is not urgent.

The author discusses the problems met with in cases of unilateral and bilateral calculi. For the removal of kidney stones he advocates pyelotomy in preference to nephrotomy. Recently the field of

application of pyelotomy has been greatly widened by extending the incision into the parenchyma after the preliminary ligation of the retropelvic artery.

Routine functional study with phthalein, the determination of the urea and creatinin content of the blood, and pyelography are all of value in determining the capacity of the involved kidney as well as the opposite kidney, and aid in the decision as to whether the treatment should be conservative (pyelotomy) or radical (nephrectomy).

H. W. E. Walther, M.D.

Ekehorn, G.: The Treatment of Hydronephrosis Caused by Abnormal Renal Vessels (Zur Behandlung der durch abnormale Nierengefässe verursachten Hydronephrose). *Zeitschr. f. urol. Chir.*, 1922, x, 111.

Ekehorn is of the opinion that under certain favoring conditions, dependent upon the course of the vessel, hydronephrosis must of necessity occur sooner or later in the presence of accessory renal vessels. In the early stages the ligation of the vessel is usually sufficient, but nephropexy may also come up for consideration. In cases of marked dilatation of the renal pelvis and changes in the kidney there may be some doubt as to the sufficiency of this operation.

In a case reported, attacks of pain occurred every month for two years. The roentgen examination was negative. The ureters could be catheterized up to a distance of 35 cm. without difficulty, but collargol did not reach the renal pelvis. At operation the renal pelvis was found markedly dilated, the kidney hydronephrotic, and the kidney surface irregular. An accessory renal artery as thick as a radial artery crossed the ureter on its anterior surface and divided into two equally large branches at the edge of the hilus. There was no stricture of the ureter. The operation consisted of simple ligation of the artery. Primary healing followed, and at the end of two years the patient was still without symptoms.

Bernard (Z).

Necker, F.: The Clinical Picture of Chronic Inflammatory Diseases of the Renal Coverings (Beiträge zur Klinik chronisch-entzündlicher Erkrankungen der Nierenhüllen). *Zeitschr. f. urol. Chir.*, 1922, ix, 409.

The author applies the term "epinephritis" to the chronic inflammatory diseases confined to the fibrous capsule, and the term "perinephritis" to inflammations of the true fatty capsule which run their course outside of the retrorenal fascia in the retroperitoneal mass of fat. The phlegmonous-suppurative form stands forth prominently as a distinct disease condition among the inflammations of the renal coverings.

In nineteen cases of perinephritic abscess operated upon, the mortality was 26.5 per cent. Disturbances on the part of the urinary tract are completely absent in uncomplicated, metastatic perinephritic abscesses. When they are present, involvement of the kidney is indicated. In cases of isolated cortical abscess of the kidney, colic and increased frequency of micturition are rarely absent.

Necker deals chiefly with the more chronic productive inflammations of the renal coverings. These are the sequelæ of protracted renal suppurations and lead to the transformation of all the renal coverings, including the fibrous capsule, into a rigid plate of tissue adherent to the surrounding parts. An attempt at extirpating changed renal coverings with the kidney would be futile and might lead to very serious secondary injuries of the pleura, the peritoneum, the vena cava, and the intestine. Therefore in such cases a subcortical nephrectomy should be done. In cases of secondary fibrosclerotic perinephritis radical treatment is indicated only when there is marked destruction of the kidney.

In the rare cases of primary indurations of the kidney, removal of the induration is followed by improvement in renal function. The author reports three cases of his own. Acute perinephritic abscess has been demonstrated a cause. Drainage of such an abscess does not lead to a cure. Only wide incision of the induration and decortication of the kidney are effective. The differential diagnosis is difficult. Gunshot injuries are another important factor in the fibrosclerotic disease of the renal coverings. All of the three cases observed were treated most successfully by splitting of the induration.

Fibrosclerotic changes of the renal coverings constitute a distinct disease arising from acute, phlegmonous inflammation of the fatty capsule. Probably they are produced by slightly virulent excitants which do not cause the breaking down of all the fatty coverings as does the ordinary paranephritic abscess, but lead to a productive chronic inflammation with massive transformation of firm connective tissue poor in nuclei. This tissue resembles the callus seen in urethral stricture and the so-called woody phlegmons of the space of Retzius.

Graham (Z).

Bruce, H. A.: Tumors of the Kidney. *Canadian M. Ass. J.*, 1923, xiii, 13.

Of all malignant tumors, those of the kidney represent the very small percentage of 0.05, and of all kidney tumors about 65 per cent are hypernephromata. It is usually impossible to say whether a given mass in the kidney region is a hypernephroma, a sarcoma, a carcinoma, or an adenoma, and it is also difficult to determine whether the mass is a tumor of the kidney itself or of the surrounding structures.

Renal tumors may arise in the parenchyma, the pelvis, or the capsule, and are of connective tissue or epithelial origin. Sarcoma is more common than carcinoma, and with the exception of the melanotic type, is usually primary. Carcinoma is usually secondary to carcinoma elsewhere—in the testis, stomach, uterus, breast, pancreas, or the other kidney. Hypernephromata occur as a rule at the

age of 55 years, but are found from childhood to advanced life. The time from the appearance of the first symptom to the recognition of the growth varies from a few weeks to three years. The tumor may be the only sign.

In the diagnosis of renal tumors the author considers three cardinal symptoms: hæmaturia, tumor, and pain. He gives points in the differential diagnosis and states that ureteral catheterization, functional tests, and pyelograms are of aid. He reports two cases of papillary carcinoma. One patient recovered but the other developed a recurrence and is now receiving deep X-ray treatment. He reports also a case of fibrosarcoma with dense adhesions of the cæcum. H. L. Sanford, M.D.

Rehn, E., and Roettger, P.: The Cause and Prevention of Secondary Hæmorrhages After Nephrotomy (Ueber Ursache und Verhuetung der Nachblutungen nach Nephrotomie). *Ztschr. f. urol. Chir.*, 1922, x, 359.

The statement made by Barth that every division of an arterial branch leads to the death of tissue (the formation of an infarct) still holds good today. Therefore the discovery that the arterial systems of the ventral and dorsal halves of the kidney are independent of each other was of great importance. In man, the plane of division found by Zondeck lies somewhat posterior to the center. Accordingly, the loss of a considerable amount of parenchyma may be avoided by the proper placing of incisions. Marwedel splits the kidney by a transverse incision.

Secondary hæmorrhage may follow nephrotomy immediately or after a period of a few days. In the authors' opinion the early hæmorrhages are due to a poor operative technique and can be prevented by careful suturing of the parenchyma.

Some time ago, Rehn called attention to the possibility that circulatory disturbances in the split kidney may be the cause of the frequently fatal secondary hæmorrhage. As nephrotomy has an unfavorable effect on the delicately co-ordinated function of the kidney, he directed his attention particularly to the physiological fixation of the split kidney to prevent kinking of the renal pedicle and choking of the vein and to obtain patency of the renal pelvis and the ureter.

His theories were tested by twelve nephrotomies performed at the Freiburg clinic during the last two years. In a case of unfixed and undrained kidney a fatal secondary hæmorrhage occurred. In ten cases healing resulted without hæmorrhage and without the formation of a urinary fistula, but in one case bleeding occurred because the catheter was removed too early and in another case a urinary fistula developed because the ureteral catheter was left in place too long (fourteen days).

While secondary hæmorrhage does not occur in all cases of poorly fixed kidneys, it is a complication in a number of cases, and the kinking of the veins is an important factor.

Stasis of the urine leads to hyperæmia and bleeding in the parenchyma of the kidney which is split or in the first stages of healing. This may be prevented, as Kuemmell suggested, by introducing a ureteral catheter through or into the bladder by way of the nephrotomy wound. If stasis of the urine occurs in the presence of an undisturbed supply of blood as the result of kinking or obstruction of the ureter, a secondary hæmorrhage may develop even after the renal wound is more firmly healed. If the wound gives way, a urinary fistula will develop and this will eliminate the danger of secondary hæmorrhage.

The following precautions are necessary for the prevention of the complications mentioned: (1) proper placing of the incision (Zondek or Marwedel), accurate co-aptation and careful suturing; (2) measures to prevent stasis of the urine; and (3) fixation of the kidney in its physiological position.

In the technique recommended by the authors a thick ureteral catheter is pushed through the renal wound into the renal pelvis and through the ureter into the bladder, and its free end fixed. This catheter is removed between the sixth and tenth days. The kidney is carefully sutured up to the opening for drainage. In pyelitis a thick rubber drain may be pushed over the catheter into the renal pelvis. The renal fixation is done in such manner that the kidney, decapsulated at its lower pole, is brought back into the normal position and pushed upward until its lower border is parallel with the costal arch. A large needle threaded with heavy silk is then inserted at the lower border of the twelfth rib, through the lower pole of the kidney, and brought out at the upper border of the twelfth rib. The thread is left in place for fourteen days.

Rofdelius (Z).

Legueu: The Immediate Results of Nephrectomy. *Méd. Press*, 1923, n. s. cxv, 51.

In considering the advisability of nephrectomy three factors must be taken into account, viz., the renal factor, the surgical factor, and the presence of tuberculosis.

In testing renal function Legueu relies on Ambard's constant. He states that when there is a constant of 0.1 or better, nephrectomy will be safe. All the other tests of renal function are only relative. After nephrectomy, from 100 to 125 c.cm. of urine are usually passed during the first three or four days, the quantity then gradually increasing. If it does not increase, glucose solution is given per rectum or under the skin.

With regard to the technique of nephrectomy Legueu states that he uses no drainage and fills the wound with glucose solution.

In cases of tuberculosis there is usually a temperature of 39 degrees C. after the operation but this continues only for a day or two. After any operation there may be generalization of the disease to the pleura, peritoneum, meninges, or bones.

V. D. Lespinasse, M.D.

BLADDER, URETHRA, AND PENIS

Lenormant, C.: A Case of Mixed Tumor, Epithelio-Sarcoma, of the Bladder of Probably Allantoid Origin (Sur un cas de tumeur mixte—epithélio-sarcome—d'origine probablement allantoïdienne). *J. d'urol. méd. et chir.*, 1922, xiv, 273.

In a woman 55 years of age Lenormant found implanted upon the summit of the bladder a tumor which in most respects differed from neoplasms commonly involving the bladder. He has found no exactly similar case in the literature though there are a few which somewhat resemble it. There was no symptom suggesting bladder disease. The tumor was diagnosed as a uterine fibroma. At operation it was found to be the size of a child's head and to involve the wall of the bladder but not the mucosa. It was removed by resecting the summit of the bladder. The patient made a good recovery.

Histologic examination of the tumor showed it to be a mixed tumor, an epitheliosarcoma. This variety of neoplasm is rare in the bladder. According to Lenormant, the only proved case of epitheliosarcoma of the bladder reported was a case published by Krompecher in 1908.

Lenormant believes that at the upper pole of the bladder there may be a persistence of embryonic rests originating from the allantoid vesicle, and that certain tumors of the summit of the bladder may be due to proliferation of such rests. Albarran, who was the first to describe bladder tumors of allantoid type, reported two cases. Hartmann also described an epithelial tumor of the bladder which he considered of allantoid origin, but his description was very brief. Lenormant has obtained a detailed description of this tumor which he gives in this article.

If the hypothesis regarding the pathogenesis of the tumors in the case reported by Hartmann and in the author's case is correct, it must be concluded that the embryonic débris of the upper pole of the bladder, like that of the cervicofacial region, may give origin to pure epithelial tumors (as in Hartmann's case) or to epithelio-conjunctive tumors (as in the author's case). These are not true vesical tumors any more than mixed tumors of the parotid are true parotid tumors. They are rather juxtavesical tumors, this explaining their excentric development and the absence of bladder symptoms.

W. A. Brennan.

Parker, W. B.: Bladder Neck Obstructions; Their Surgical Relief in Reference to the Young Punch. *Surg., Gynec. & Obst.*, 1923, xxxvi, 56.

The author states that while the various phases of bladder neck obstruction are common, the pathological physiology of the musculature with regard to increased tone, spasms, dysuria, tenesmus, and retention has not been satisfactorily explained on the basis of the symptoms and the pathology found at operation or at the time of diagnosis. The bladder neck and its muscle fibers are seldom primarily at fault in these disturbances.

Long continued spasm of the bladder neck must surely culminate in pathologic changes such as hypertrophy, proliferation of fibrous tissue, and reduction of resiliency.

The most common factors in the production of bladder neck obstructions other than prostatic adenoma are postinflammatory changes in the mucosa following posterior urethritis and cysto-urethritis. These conditions at the onset are apparently insignificant, but have a distinct set of symptoms, such as intermittent urethral discharge, without infecting organisms, various degrees of difficulty in the voiding reflex with increased frequency, slight or even marked impotence, and occasional bleeding at the end of urination. Parker states that little attention has been paid to contractures of the bladder neck with or without prostatic hypertrophy, and that in the fear of causing incontinence many urologists have refused to attack changes in this location even when the bladder was open and such changes could be seen and felt. In Parker's opinion the Young punch has given brilliant results by removing the inflammatory tissue not only as a groove upon the floor but around the entire involved vesical ring.

Postoperative contraction is another type of obstruction which may occur after enucleation of the prostate by either route.

The various modifications of the Young punch are compared and their respective merits and indications are stated.

The author concludes that in many cases of obstruction at the neck of the bladder the causes are not only local infections but also remote foci and systemic toxæmias. The MacGowan modification of Young's technique he regards as the best method for most cases of this character, and the modified Young punch or median bar incisor as the most efficient and safe instrument for the surgical relief of such contractures.

The mortality rate has been practically nil and hæmorrhage does not occur. The preparation of the patient is of the greatest importance.

J. S. Eisenstaedt, M.D.

Plisson, L.: Associated Closed Traumatic Ruptures of the Posterior Urethra and Bladder (Contribution à l'étude des ruptures traumatiques fermées associées de l'urèthre postérieur et de la vessie). *Lyon chir.*, 1922, xix, 535.

Concomitant ruptures of the posterior urethra and the bladder with vertical disjunction of the symphysis pubis are very rare. Plisson reports such an injury in a man who was thrown from his horse. The symptoms suggested rupture of the bladder with pelvic fracture.

A suprapubic incision disclosed vertical disjunction of the pubes and rupture of the neck of the bladder. The tear was situated so low and the retropubic region was so contused that bladder suture was not attempted. A hypogastric drain was inserted and the space of Retzius tamponed.

Several days later an attempt at catheterization revealed a rupture of the posterior urethra not recognized at the first examination. Suturing of this rupture was delayed for several months to await the closure of the space of Retzius and the establishment of the hypogastric meatus. The patient left the hospital in excellent condition.

In the literature Plisson found only three other cases of simultaneous rupture of the bladder and urethra following a pelvic injury not opening the superficial tissues, and these were not exactly the same as the case reported in this article.

With regard to the surgical treatment the author states that the method of choice consists in suture of the urethra and suprapubic drainage of the urine. When suture of the urethra is impossible, the treatment indicated is suture of the bladder, perineal drainage of the urine by means of a retention catheter, and subsequent repair of the urethra by the method of Pasteau and Iselin. If neither the bladder nor the urethra can be sutured, suprapubic drainage of the bladder and drainage of the posterior urethra through the perineum should be instituted at the primary operation and the urethra repaired by the Pasteau and Iselin method at a second operation later on.

The same result can be obtained more rapidly by opening the perineum and the bladder, catheterizing the urethra either by the meatus or by the retrograde route, leaving the urethra to cicatrize over the sound left *in situ*, and allowing the suprapubic opening to close secondarily after urethroperineal cicatrization. W. A. Brennan.

Schiller, H.: Regeneration of Resected Urinary Bladders in Rabbits. *Surg., Gynec. & Obst.*, 1923, xxxvi, 24.

Regeneration is usually defined as the re-formation of a lost part or parts of a morphological unit, or the new formation of lost cells from cells of the surrounding tissue. It is the replacement of a lost part by a newly-formed part corresponding in form, structure, and size.

There are two forms of regeneration: the physiological, such, for example, as the constant reformation of epithelial cells, hair, blood cells, etc; and the reparative, which we see as a sequel to loss of tissue substance following trauma. Closely related to regeneration is the process of compensatory hypertrophy observed in the glandular organs of vertebrates (kidneys, ovaries, etc.).

The author's experiments with regard to regeneration of the bladder were performed on rabbits under 6 months of age. The bladder was extirpated down to the ureteral orifices and anteriorly, close to the urethra. The cavity left was scarcely large enough to hold ½ c.cm. of fluid. Of the nine animals, only two were lost through infection. Within eighteen months the size of the newly formed bladder in the cases successfully operated upon was within one-third the size of the normal bladder. No changes in the ureters or pelvis of the kidneys could be found.

The histologic findings indicated that these reformed bladders were the result of a true regenerative process. The muscle fibers and the muscle bundles in the new-formed wall were slender, whereas in hypertrophic and hyperplastic conditions the contrary would be expected. Hyperplasia no doubt takes place shortly after the resection, but regeneration sets in soon. H. W. Plaggemeyer, M.D.

GENITAL ORGANS

Sand, K.: Ligation of the Vessels (Epididymectomy) by Steinach's Method as a Means of Rejuvenation in Old Age and in Other Conditions such as Impotence and Depression. (Vasoligatur—Epididymektomie—nach Steinach angewandt als Verjuengungsmittel bei Greisentum und anderen Zustaenden wie Impotenz und Depression) *Ugesk. f. Læger*, 1922, lxxxiv, 507, 150.

Six months ago Sand performed on dogs his first experiments on resection of the epididymis. He is now able to report that the results have been lasting as well as brilliant. The first similar operation on man he performed in September, 1920. The effect of the operation cannot be regarded as a true rejuvenation. The phenomena of old age are merely somewhat retarded by the processes set up by the vasoligation.

In this article the author reports fifteen cases.

Attention is called to the difficulty in judging the results of such an operation and the importance of collecting a large number of cases on which to base our conclusions. In every case the author carefully explained the problem to the patient and made it clear that the operation was still in its experimental stage and that its certain result was sterility. In order to exclude suggestion, he had the patients write up their own case records. The condition of the patient was recorded very carefully, and his weight, blood pressure, and dynamometer readings were given.

The technique of the operation is of particular importance. Sand was not content with a simple vasectomy, even at the cauda, always performing an epididymectomy. This must be done with the greatest caution. Several centimeters of the epididymis, high up on the caput, should be exposed with small instruments with care to spare the blood vessels and nerves for the nourishment of the testicle. After exposure, Kocher clamps are applied at the upper and lower limits of the area to be resected. Both stumps are cauterized with a Paquelin cautery to insure cicatrization. The tunica propria is closed with a pursestring suture.

The case histories are given in full. From these it is seen that the patients suffered no harm from the operation and were pleased with the result. There was wide variation as to the time of the appearance of the reaction. In this connection it must be remembered that there is an extraordinary difference in the condition of the tissues of the body, especially in older persons, in many of whom they

are so much altered that any regeneration is out of the question. The author believes he is justified in stating that with this operation it is possible to influence the organism in the sense of stimulation, regeneration, or restitution, but not in the sense implied by the term "rejuvenation." Port (Z).

Stanley, L. L.: An Analysis of 1,000 Testicular Substance Implantations. *Endocrinology*, 1922, vi, 787.

The injection underneath the skin of the abdomen of testicular substance cut with a knife or cork-borer into strips suitable for a pressure syringe similar to the Beck paraffin syringe gave Stanley some very interesting results. The testicles of rams were used. The work was done on prisoners in San Quentin, the state prison of California.

The results of these 1,000 treatments carried out on 656 men indicate that testicular substances have a decided effect on general asthenia. This term is applied to the condition of persons who are underweight, lack energy, sleep poorly, have a poor appetite, and, to use their own expression, are "all run down."

The treatment does not cure impotency, although some of the men treated who had had no sexual manifestations for years reported renewal of function. Three of the patients who were normal sexually before the implantation reported that afterward their potentialities in this respect had disappeared.

In cases of acne vulgaris, asthma, and senility, striking objective improvement was noted. There was improvement also in cases of rheumatism, neurasthenia, poor vision, and a few other conditions. The results are tabulated as follows:

Condition	Total cases	Benefited	Not benefited
General asthenia	340	305	35
Acne vulgaris	56	54	12
Rheumatism	58	49	9
Neurasthenia	56	33	23
Poor vision	41	32	9
Asthma	31	18	3
Tuberculosis	17	10	7
Senility	34	27	7
Sex instinct	95	81	14
Impotence	19	12	7
Psychopathic inferiority	8		8
Epilepsy	5	3	2
Dementia praecox	8	1	7
Paranoia	3	2	1
Diabetes	4	3	1
Locomotor ataxia	3	3	
Drug addiction	13		

Eleven of the subjects are dead and the results in twenty-eight cases are unclassified. With regard to thirty cases no report has been obtained.

H. W. E. Walther, M.D.

MacKenzie, D. W., and Seng, M. L.: The Prostatic Problem. *Surg., Gynec. & Obst.*, 1923, xxxvi, 182.

The authors do not wish to draw comparisons between different methods of performing prostatectomy, but desire rather to describe the routine which has given them the best results in the Department of Urology of the Royal Victoria Hospital.

In their hands the operation which meets the three requisites, simplicity of management, ease and safety in performance, and satisfactory final results, is the so-called two-stage suprapubic prostatectomy.

On admission, a searching history is taken, particular attention being paid to frequency, dysuria, hæmaturia, and alteration in the urinary stream. It has been noted that hæmaturia is more common in benign conditions of the prostate than in malignant conditions.

The patient is closely questioned also regarding his general health—appetite, sleep, headaches, constipation, bad taste in the mouth, dryness of the tongue, torpor, loss of weight and strength—conditions pointing to a general intoxication due to impaired renal function.

Next, a complete physical examination is made which includes exploration of the urethra and the determination of prostatic obstruction, the amount of residual urine, and the extent of the prostatic involvement as palpated per rectum. Not unimportant is the estimation of the blood pressure, which frequently is high and falls 20 to 30 mm. of mercury upon relief of the retention. Repeated urinalyses are done: 90 per cent of these cases of prostatism show the presence of infection by pus and blood in the microscopic specimen. Often the specific gravity is low. The examination includes also repeated phenolsulphonephthalein tests of renal function and a chemical examination of the blood.

In every case roentgenograms are made to determine the presence or absence of vesical or renal stones. Cystoscopy is done only in selected cases to determine or verify the presence of stone, the extent of intravesical enlargement of the prostate, and the presence of vesical diverticula.

In cases of residual urine an indwelling catheter is placed in the urethra, when tolerated, or the patient is catheterized every eight hours until such time as suprapubic cystotomy is performed. The average period of drainage in this manner has been five days.

The suprapubic cystotomy is usually done under local anæsthesia. The bladder is anchored securely to the anterior abdominal wall to prevent herniation of the peritoneal fold into the wound. A French 36 Pesser catheter is inserted into the bladder and drawn snugly against its vault so that the "mushroom" fits firmly against the bladder wall. A prevesical drain of iodoform gauze or a cigarette drain is placed in the space of Retzius.

The wound is dressed daily with alcohol dressings, and the bladder irrigated daily with boric acid solution or 1:10,000 silver nitrate. Urinary antiseptics are given and the tube removed and cleaned if necessary.

The second stage—the prostatectomy—is done when the patient has become a good surgical risk, a few weeks to a few months later.

The enucleation of the prostate is performed under gas anæsthesia; ether is rarely used. Ether anæsthesia is not contra-indicated if it is just sufficient to cause relaxation, and brief, and if the patient's general condition warrants its use.

The prostate is enucleated by rupturing into the roof of the prostatic urethra, finding a line of cleavage, and shelling the prostate out, assisted by two fingers in the rectum. After its removal no tube is placed in the bladder. The wound is covered with a sterile dressing.

A routine to lessen hæmorrhage has been the administration of horse serum subcutaneously, and 20 gr. of calcium lactate by mouth every two hours before and after the operation.

A nurse is detailed to the case to remove blood clots and change the dressings whenever necessary. After three or four days the bladder is irrigated daily through the suprapubic sinus. After a week or ten days irrigation may be done by catheter through the urethra. Acid sodium phosphate and plenty of water are given. The wound is kept clean by frequent dressings and stimulation. At the end of two or three weeks sounds may be passed.

C. R. O'Crowley, M.D.

Barney, J. D., and Shedden, W. M.: A Study of Anæsthesia in Prostatectomy. *Surg. Clin. N. Am.*, 1922, ii, 1093.

The authors have undertaken a study of 250 patients operated upon for different types of obstructing prostate. The average age was between 62 and 63 years. The youngest was 41 and the oldest 83. The blood pressure was 150+ systolic and 84+ diastolic. There were 251 anæsthesias: spinal in 101, nitrous oxide-oxygen in seventy-eight, ether in sixty-eight, and local anæsthesia (infiltration of the gland and sacral) in four. The total mortality was 18.8 per cent. In the forty-seven fatal cases spinal anæsthesia was used in twenty-eight (27.45 per cent), ether anæsthesia in eleven (16.1 per cent), and nitrous oxide-oxygen anæsthesia in eight (10.2 per cent). The chief cause of death was sepsis in twenty cases (42.5 per cent), pneumonia in seven, hæmorrhage in six, renal insufficiency (uræmia) and circulatory disturbances (embolus, apoplexy, myocarditis, etc.) in five cases each. In four instances it was impossible to determine the cause.

Perineal operations were done in thirty cases, with nine deaths (30 per cent), and suprapubic operations in seventy-one (thirty-two two-stage operations), with nineteen deaths (26.7 per cent). Of the 101 cases, twenty-nine were given tropococaine, twenty-six novocaine, sixteen apothesine, eight novol, three procaine. The drug employed in nineteen cases was not stated, but probably was tropococaine. Cancer was found in about 15 per cent of the cases, and nearly one-third of these patients died, as compared with less than one-fifth of those with adenomata. In any considerable group of cases of spinal anæsthesia "spinal reactions" ranging from nausea and vomiting, sighing respiration, and a soft, slow pulse to an alarming syndrome characterized by incontinence of fæces, cyanosis, profuse sweating, a thready, soft slow pulse, sighing restlessness, and stupor, is to be expected in nearly 10 per cent.

Thomas F. Finegan, M.D.

Bryan, W. A.: Recurrence of the Benign Prostate. *Surg., Gynec. & Obst.*, 1923, xxxvi, 59.

The author intends the word "recurrence" to mean the formation, at longer or shorter intervals following what had been considered a complete prostatectomy, of masses of prostatic tissue reproducing the original symptoms caused by urinary obstruction.

He uses the word "benign" in the sense that clinically and microscopically the secondarily appearing growths were not malignant.

He points out that there cannot, of course, be a true recurrence of removed pathologic tissue and that apparent recurrences are due to the growth of prostatic lobes or tissue not palpable at the time of the original operation which began to hypertrophy after the removal of the rest of the gland. He reports three such cases in his practice and draws attention to the necessity for bearing this possibility in mind in passing judgment on the work of a previous operator.

H. S. Sanford, M.D

Schinz, H. R.: Castration of the Male by the X-Ray (Ein Beitrag zur Roentgen-Kastration beim Mann). *Schweiz. med. Wchnschr.*, 1922, lii, 886.

The author castrated a man 34 years old by means of the X-ray. Just as in the female the functional condition of the ovaries makes a difference in the dosage necessary to obtain one of the various degrees of castration, so also in the male different doses are necessary in order to obtain one of the three phases of castration discussed by the author. The determination of the dose is very difficult as clinical signs indicating the time of spermatogenesis, upon which the size of the dose should be based, cannot be determined.

The phases of castration and the doses necessary to obtain the desired degree of castration are given as follows:

1. Temporary sterilization with clinical oligonecrospermia. Necessary dose, at least 34 per cent of the skin unit dose in the male; 30 per cent in the female.

2 Total permanent aspermatogenesis. Dosage, about 60 per cent of the skin unit dose in the male; in the female with Wintz exovulation, 32 per cent.

3. Total castration with destruction of all the constituent elements of the testicle. Dose for male not yet determined; in the female, 34 per cent of the skin unit dose.

Rosenburg (Z).

MISCELLANEOUS

Nichols, B. H.: Important Points in the Technique of Roentgenological Examinations of the Urinary Tract. *Am. J. Roentgenol.*, 1923, x, 19.

When a case is referred to the roentgenological laboratory for examination diagnostic plates are made of the entire urinary tract. This is usually done without preliminary preparation, and if a suspicious shadow is found a second examination is made after thorough cleansing of the bowel by saline cathartics and enemas. The technique employed consists of the use of duplitized films with double screens and a Potter-Bucky diaphragm and an inflated rubber bag for compression.

If a definite shadow is visualized in the kidney area an attempt is made to locate it accurately by making a pyelogram. If it is in the pelvis, the injected fluid usually obscures the stone. A suspicious shadow in the ureteral area on either side is checked by catheterization of the ureters with an opaque catheter and films made at two different angles to determine the proximity of the shadow to the catheter. At times even this procedure is not sufficient to show whether or not the shadow is that of a stone within the ureter. If the ureter is dilated the shadow may be at some distance from the catheter; in such case, a ureterogram will give the required information.

The visibility, size, shape, and position of the kidneys is included in every report, together with a statement as to the presence of spinal lesions or any other pathologic condition of adjacent organs which may in any way account for the symptoms. When the films show no calculus, mention is made of the possibility of non-visibility of stones in a small percentage of cases.

If all the findings are negative and the clinical symptoms and history indicate disease, such additional procedures as catheterization with an opaque catheter and the injection of opaque media into the kidney pelvis and ureter are indicated. Thus hydronephrosis, hydro-ureter, deformed kidney pelvis, and obstruction or kinks in the ureter may be demonstrated. A 20 per cent solution of sodium iodide is the most satisfactory solution for pyelography. Roentgenograms are made in both the horizontal and the vertical positions. A modified Young cystoscopic table with a Potter-Bucky diaphragm built into it has been found to answer practically all requirements. ADOLPH HARTUNG, M.D.

Eisendrath, D. N.: Newer Aspects of Urinary Surgery. *J. Iowa State M. Soc.*, 1923, xiii, 25.

To make a diagnosis of a surgical affection of any part of the urinary tract one must be ready to apply all of the modern methods. Of the special methods of diagnosis Eisendrath is especially impressed with pyelography. Fatalities which formerly followed this procedure were due to the pressure with which the liquid was injected and to the toxicity of the drug. These dangers have been entirely eliminated by the use of sodium bromide which is non-toxic, and by allowing the solution to flow in by gravity from a height of 3 ft.

A normal pyelogram will exclude the kidney in cases of abdominal tumor, prove the presence of hydronephrosis, and give a characteristic picture in destruction of kidney substance, renal neoplasm, calculus, and anomalies. Ureterography and cystography are equally useful.

Methods of treatment have improved correspondingly. Because of early diagnosis by modern methods, from 55 to 60 per cent of cases of renal tuberculosis are permanently cured. Lavage and drainage of the renal pelvis have made it possible to conserve a large number of kidneys which formerly would have been removed. The author has obtained the best results from ½ to 3 per cent silver nitrate. He states incidentally that he considers the possibility of renal infection in every case of obscure fever.

Eisendrath attempts to remove small calculi by relaxing the ureter by procaine and papaverine and dilating. In the majority of cases such treatment is successful. B. F. ROLLER, M.D.

SURGERY OF THE EYE AND EAR

EYE

Hogg, G. H.: Pemphigus of the Conjunctiva. *Med. J. Australia*, 1922, ii, 356.

The author reports four cases of this rare condition which were collected during twenty-six years of ophthalmological practice in Tasmania.

None of the patients exhibited any signs of syphilis. The etiology is unknown, but cultures from the conjunctival sacs revealed Friedlaender's diphtheria bacillus and Gram-positive and Gram-negative cocci. Probably some of these were due to contamination.

Pemphigus of the conjunctiva begins with redness and a sticky, non-purulent secretion. In some cases there may be small papules or bullæ, but the actual bulla is seldom seen because the epithelium of the conjunctiva is so delicate that it quickly breaks when it is raised up by exudation. As the process progresses, cicatrization and shrinking of the conjunctiva take place slowly, the conjunctival culs-de-sac becoming shallower and finally obliterated, the folds of conjunctiva stretch from the lids to the eyeball, and the movement of the eyeballs becomes impaired. The secretion of the eye, which is at first increased, becomes diminished, and the surface of the eye becomes dry. The cornea becomes opaque and may ulcerate; in advanced cases it often becomes dry and lusterless and fine scales may be shed from it. Trichiasis and entropion may develop, and the lids may become totally adherent to the eyeball.

The prognosis is most unfavorable, treatment seeming to be of little avail when the eye, mouth, and throat are involved.

Arsenic, which is often given, seems to exert a beneficial influence, if not on the eye condition, at least on the general health. Mercury and iodides have been prescribed in error, the condition being mistaken for syphilis; they have a most harmful effect and should never be used. Soothing lotions and oily applications may be employed for the eyes, and, if necessary, operations may be performed for the trichiasis and entropion. Nothing, however, has a permanent effect. C. Corbin Yancey, M.D.

Stark, H. H.: The Etiology of Sympathetic Ophthalmia. *Am. J. Ophth.*, 1923, vi, 29.

The theories as to the etiology of this disease fall into groups corresponding to the different periods of development in medical science. The most recent is Elschnig's theory of anaphylaxis which has been seemingly confirmed by Wood's experiments though other investigators express doubt as to the possibility of the development of an auto-anaphylaxis. Kodama holds that any tissue of the eye may produce more than one antigen, some of them common to all the eye tissues, and others specific to a special tissue.

According to the most rational theory the antigen is developed through endogenous infection of the uveal tract by micro-organisms which may remain in the host for many years. The two organisms known to cause clinical symptoms similar to those of sympathetic ophthalmia are the tubercle bacillus and the spirochæta pallida both of which at times exhibit a decided affinity for all the tissues of the eye. The complement-fixation test eliminates syphilis as the primary factor.

Four arguments indicating that the tubercle bacillus is a factor are presented:

1. About two-thirds of the cases of ophthalmia develop in early life, when slight or no immunity has been developed. This is in agreement with MacKenzie's observation that cases are most common in scrofulous children. Although as a rule the condition occurs within a few weeks after injury, in some cases it does not develop until years later, a fact indicating that the infecting organisms may be present at the time of the injury but remain dormant. This is true of the tubercle bacillus. If immunity becomes lowered, the bacilli may be distributed by the circulation and attack weakened or diseased tissue.

2. The clinical picture common to ocular tuberculosis and sympathetic ophthalmia is that of choroiditis, papillitis, plastic iridocyclitis, and nodules in the iris.

3. The ordinary pathologist is frequently unable to differentiate between the two conditions.

4. Gifford's method of using salicylates corresponds to the treatment of scleritis, which is believed to be due usually to tuberculosis.

The author has attempted to produce an antigen by culturing tubercle bacilli in a medium containing the uveal tract and also in the living eye. The results of these experiments will be reported later.

C. Corbin Yancey, M.D.

Knapp, A.: Metastatic Thyroid Tumor in the Orbit. *Arch. Ophth.*, 1923, lii, 68.

Conheim was the first to recognize the fact that a struma may cause metastases. Such a struma he called a "metastatic benign struma." The metastases occur in the bones and in the lungs.

A case reported by Knapp was that of a man 66 years of age who presented himself for examination complaining of discomfort in reading and a soft mass in the upper margin of the right orbit occupying a round defect in the bone where pulsation could be felt. At operation the mass was found to be a tumor in the medulla of the bone involving particularly the anterior part of the frontal bone. The cavity was filled with soft, dark red material which was

adherent to the periosteum below and bled profusely. The bony walls of the cavity were smooth.

The pathologist's report was "adenoma of aberrant thyroid tissue reproducing thyroid structure to the smallest detail; many alveoli containing soft acidophile colloid surrounded by flat thyroid cells."

Symptoms of other metastases appeared one and one-half years later in the orbit, scapula, ribs, lungs, and pubis, and a distinct tumor extending behind the sternum was discovered in the thyroid gland.

The metastases of adenocarcinoma of the thyroid may show normal thyroid adenomatous tissue. They grow slowly. The primary tumor in the thyroid is small and escapes detection, often not being found until the character of the metastases is recognized.

S. S. Howe, M.D.

Smith, D.: Factors Influencing the Choice of Method for Cataract Extraction. *Arch. Ophth.*, 1925, liii, 25.

No single method of cataract extraction is entirely satisfactory as a routine for all cases.

The methods considered typical are extraction after capsulotomy and extraction in the capsule, either by pressure only, as practiced by Smith, or by traction. The traction methods comprise traction with the forceps, as recommended by Verhoeff and Greenwood, traction by means of a vacuum, as in Barraquer's method, and combined traction and pressure as advocated by Knapp and Torck.

The factors which influence the choice of method are considered in three groups, the first including the age of the patient, the type and the stage of maturity of the cataract, and the presence of complications; the second, the probable behavior of the patient, the prominence or recession of the eyeball, and the size of the cornea; and the third, the conditions affecting the operator, such as his skill and training, the frequency with which he operates, and the quality of his assistance.

Smith distinguishes three types of cataract in children: the membranous, which he extracts with forceps, the milky, which he needles, and the jelly-like flocculent cataract, which he removes by linear extraction.

In cases of senile cataract the younger the patient the smaller the nucleus and the stronger the attachments of the lens, both zonular and hyaloid. Therefore the Smith method is apt to be too difficult and capsulotomy should be done on all patients under 40 years of age and most of those under 55.

Six types of lenses are distinguished in senile cataract, viz., the immature, swollen, mature, small hypermature, thin hypermature, and sclerosed.

To predict the size, shape, and consistency of the lens and the strength of the capsule correctly requires much experience.

Highly myopic eyes are perhaps best treated by the gentlest capsulotomy operation in which the smallest section is made that will allow the easy escape of the nucleus.

In eyes with a tendency to glaucoma intracapsular extraction seems to be safer, probably because of their freedom from soft lens matter, blocking of the pupil, and capsular tags in the wound.

Bulging eyes and tightly fitting lids are not suited to any type of intra-ocular operation. For the eyes of poorly nourished persons which are sunken and deep set and have flaccid lids the intracapsular extraction is ideal. The predominance of this type of eye in India is an important factor in the success of intracapsular extraction in that country.

Cases of small cornea are unsuitable for intracapsular extraction unless the entire section is made well in the sclera as small corneæ do not imply small lenses nor shallow anterior chambers, and in these cases the sclera may always be safely transfixed.

Intracapsular extraction by traction requires a strong capsule such as is to be expected only in the very late mature and hypermature cases and in membranous and after-cataracts.

Dislocated lenses and cases complicated by glaucoma or uveal disease invite extraction in the capsule. Intracapsular methods should be chosen only for cases in which they are definitely indicated.

S. S. Howe, M.D.

Elliot, R. H.: The Mists and Halos of Glaucoma. *Am. J. Ophth.*, 1923, vi, 1.

The subjective symptoms of glaucoma are closely associated symptoms arising from the diffraction of light. The halos belonging to glaucoma arise in the cornea and must be distinguished from those due to the crystalline lens or produced by air bubbles or cells on the corneal surface.

Elliot reports a careful study of the differences observable between these kinds of halos, all of which are considered diffraction phenomena.

As this excellent discussion suffers by condensation, those interested should refer to the original article.

C. Corbin Yancey, M.D.

EAR

Kerrison, P. D.: The Improvised Artificial Drum as an Aid to Hearing: A Study of Certain Principles Involved. *Laryngoscope*, 1923, xxxiii, 1.

The first demonstrable functional change in hearing in cases of chronic catarrhal otitis media and kindred lesions with an intact drum membrane is a very slight loss of acuteness in the hearing of the conversational voice and diminished hearing distance for the watch or acoumeter. Frequently the patient can hear the ordinary watch only a few inches from the ear or only on contact, while he hears musical tones down to twenty-six double vibrations or even lower.

When there is considerable destruction of the drum membrane, with or without partial destruction of the malleus, the first functional change is a decrease in the hearing range at the lower end of the musical scale.

Perforations in Shrapnel's membrane do not have any influence on hearing

In cases of extensive perforations of the drum membrane a bit of sterile cotton flattened and cut into a disc-like shape and applied against the perforation or against the tympanic structures presenting at the fundus of the canal will often increase hearing. Quite as often, however, it is absolutely without influence. It is thought that when the cotton disc is beneficial it finds favorable contact with the ossicular chain, re-establishing the conduction of sound waves along the normal pathway.

The change in balance is perhaps the chief factor in the pronounced deafness in certain cases in which the drum membrane has been destroyed, and in varying degrees is a contributory factor in all such cases. It is obvious that whatever reduces the difference between the respective degrees of mobility of the ossicular chain and the round window membrane under the direct impact of sound waves must necessarily interfere with the movements of the cochlear fluids and therefore reduce the hearing power.

The author reports a case of chronic suppurative otitis of both ears in which a cotton disc was applied to the remaining portion of the ossicular chain in the right ear without any improvement in hearing. A thin slip of paper saturated with alcohol was then placed against the postero-superior canal wall and by means of a cotton applicator slid inward and downward into contact with the inner tympanic wall so that it passed over and approximately covered the region of the round window. The patient immediately remarked on the improvement in hearing.

Kerrison has tried the paper slip method but found that in a number of cases it failed. Cases of deafness due to firm ankylosis of the stapes within the oval window are among those logically giving negative results. In some cases the use of both a cotton disc and a paper slip gave good results.

JAMES C. BRASWELL, M.D

Lillie, H. I.: A Septic Type of Temperature Not Referable to the Ear in Cases of Acute Suppurative Otitis Media. *Ann. Othol., Rhinol. & Laryngol.*, 1922, xxxi, 990.

If a patient with acute suppurative otitis media has a septic type of temperature, the natural tendency of the otolaryngologist is to ascribe the fever to extension of the infection from the ear and mastoid to the sigmoid and lateral sinus. It has been well established in such cases that in taking time to make a differential diagnosis the physician does not endanger the patient. Such a course may reveal involvement of other structures which will account for the clinical picture.

It is believed that in five cases reported in this article four different disease conditions acted as causal factors of the septic type of temperature, namely: pyelitis, central pneumonia, an abdominal postoperative condition, and a gastro-intestinal disturbance. Treatment directed to these conditions appeared to clear up the symptoms, while operation in at least one would doubtless have resulted fatally.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Blackwell, H. B.: Some Clinical Observations on the Correction of External Deformities of the Nose by the Intranasal Route. *Laryngoscope*, 1923, xxxiii, 21.

Concave deformities approaching and including the saddle-back nose, whether caused by syphilis or trauma, are corrected by the use of rib and cartilage grafts about 2 in. in length, taken from the anterior end of the eighth rib. The graft is split from side to side and from end to end and inserted through an intranasal incision at the mucocutaneous margin of the vestibule, lateral to the septum. The smooth, curved surface of the rib is placed uppermost and the upper end of the graft placed in contact with the lower end of the frontal bone. For lesser deformities of this type a cartilaginous graft from a nasal spur or from the septum is used.

In cases of convex deformity, the beak-like nose, an intranasal incision is made in the soft parts below the deformity, to one side of the junction of the septum with the lateral wall of the nose. The concavity is removed subperiostally with forceps.

For the correction of lateral displacements, which are frequently associated with deflection of the nasal septum, a submucous resection is done and the nasal bones are refractured at their attachment to the frontal bone.

In cases of long nose or a nose with a low tip and cases in which the septal cartilage is lowered with corresponding elevation of the lateral alar cartilage the soft tissues of the nasal partition below the cartilaginous septum are separated from its inferior edge by a through-and-through incision from the mental process of the superior maxilla to the tip of the nose. A second incision is made low down over the bridge and the lateral aspects of the nose and the soft parts are freely elevated. To elevate the tip, a triangular piece of cartilage with its perichondrium is removed from the lower edge of the septum, and the soft septal tissues are united by through-and-through sutures.

General anæsthesia is usually employed. After the operation vaseline is applied to the skin over the nose and face. In cases of convex deformity and lateral displacement, a thin wet pad of boracic acid gauze is placed over the nose for twenty-four to forty-eight hours. W. B. Stark, M.D.

Stein, O. J.: The Intranasal Injection of Alcohol in the Treatment of Hyperæsthetic Rhinitis and Some of the Nasal Neuroses. *Ann. Otol., Rhinol. & Laryngol.*, 1922, xxxi, 1129.

The vasomotor disturbances of the nose may be treated by a direct attack upon the nerves or by an attempt at desensitization. The results obtained by the latter, however, have not been found very satisfactory.

In every instance a searching survey of the nasal chambers should precede any radical method of treatment. Local pathology in the nose should be dealt with properly.

It is a well-recognized fact that the great fifth nerve and its intimate connections with the sympathetic and motor nerve systems plays an important rôle in a variety of disturbances arising from its stimulation or irritation, whether this takes place from within or without. Just why irritation of these nerves should be followed in one instance by pain, in another by reflex asthma, in another by rhinorrhœa, and in another by the so-called hay-fever syndrome is a physiological anatomical study which opens up an immense field for speculation and investigation.

The distribution of the intranasal nerve supply may be divided into two divisions. The anterior division is the nasal or ethmoidal nerve. The posterior divisions are branches of the sphenopalatine ganglion. After the production of local anæsthesia with cocaine the anterior division is injected at its foramen or where it enters the nose. A specially designed needle and syringe are used for this purpose.

In injecting the posterior division the region of the sphenopalatine foramen is the point of election. A special needle is used also for this purpose. The injection should be preceded by the application of cocaine to the region of the ganglion.

Alcohol is the most suitable substance for injection because it is sterile, non-toxic and non-corrosive. A 75 per cent solution of absolute alcohol with sterile water is used. About 10 minims are employed for each injection.

The functional activity of the nerve is restored to normal within a variable period. Seasonal cases may require re-injection each season. The more exact the injections the more effective and lasting the results. French K. Hansel, M.D.

Grove, W. E.: Mishaps in the Puncture and Irrigation of the Maxillary Sinus. *Ann. Otol., Rhinol. & Laryngol.*, 1922, xxxi, 913.

In 1761, a French dentist, Jourdain, by sense of touch alone and without the use of artificial illumination, irrigated the maxillary sinus through the ostium maxillare. In 1853, Hartman reported three cases cured by irrigation through the natural opening into the antrum, and in 1889 he treated thirty-two cases by irrigation through the natural opening or by pushing a dull cannula through the posterior fontanelle.

Puncture through the inferior meatus for aspiration was first described by Moritz Schmidt in 1888. Lichtwitz, in 1890, syringed through the inferior meatus, and Capdepont, in 1894, practiced air inflation by this method.

Gurlitz discovered that the veins of the antral mucosa are very numerous, and that frequently there is a thick venous plexus, sometimes on the orbital wall, sometimes on the nasal wall.

Grove has collected the reports of fifteen cases in which death followed antrum puncture, air inflation, and irrigation of the antrum. In eleven cases it occurred in a few minutes and in four at the end of a period varying from a few hours to thirty-six hours. According to the case reports in which sufficient detail was given, the ante-mortem symptoms were very much the same in every instance. There was sudden collapse with unconsciousness, cyanosis, pulse and respiration changes, tonic and clonic contraction of the various groups of muscles or of all the muscles, and sometimes epileptiform attacks. "We must therefore assume from the more or less common symptomatology preceding death in all cases that we are dealing with a causative factor which is common to all of them." The puncture was done seven times from the inferior meatus and three times from the middle meatus; the route in five cases was not mentioned.

Autopsies were performed in seven cases. Three were negative. In two cases, minute hæmorrhages or signs of stasis were discovered in various organs, and in two cases air was found in the circulation. Bowen's case showed a detached thickened mucosa of the sinus with a needle wound.

Another series of twenty-nine cases collected from the literature included twenty-five cases of puncture and irrigation of the maxillary sinus and four cases of inflation of the sinuses with air. In the twenty-five cases the puncture was done fifteen times through the inferior meatus and twice through the middle meatus; in the remaining eight case reports the route of the puncture was not given. In this group collapse occurred and there were serious general symptoms, including suspended or altered breathing, pulse changes, tonic and clonic contraction of the muscles, hemiplegias, etc.—the same general symptoms as those in Group 1—but no fatalities.

In a third group of cases, six in number, the common symptom was transitory blindness.

These three groups were similar in many respects. The complications were apparently not due to infection or faulty technique.

A fourth group was made up of cases in which the complications were caused by forcing air, irrigating fluid, or products of infection into the tissues adjacent to the antrum during the act of puncture or irrigation. There were no fatalities.

The author reports the case of a young adult who had an acute maxillary sinus infection with redness of the left eye and pain below it. Treatment consisted of infraction of the middle turbinate followed by shrinkage and suction for one week and then irrigation of the antrum. Seventeen days after the beginning of treatment, 1 c.cm. of a 5 per cent protargol solution was introduced into the sinus after irrigation. When the attempt was made to introduce a second 1 c.cm., the injection caused extrusion of the bulb, marked subcutaneous swelling of the upper and lower lid, and great pain in and around the eye. Crepitations could be felt in both the upper and the lower lid near the inner canthus.

Treatment by the application of heat to the eye, catharsis, and sweating was given. After twenty-four hours ice was used instead of heat. Optic atrophy developed and the sight of the eye was lost.

The author believes that the causative factor was the same in all of these cases. As the complications did not occur at the time of the puncture itself but developed later during the period of air inflation or syringing, the puncture itself as a cause can be eliminated.

It is improbable that cocaine or novocaine poisoning was responsible for the complications as many of the patients had had previous cocaine or novocaine anæsthesia without untoward results.

Two other possible causes are: (1) a nasal reflex through the vagus and trifacial nerves, (2) air embolism.

Air embolism is thought to be the cause of the complications in the cases of Group 1 and in most of those of Group 2. The air enters the circulation during the inflation of the antrum through the puncture of a vein in the antral mucosa, proceeding by way of the facial and jugular vein to the right heart.

The complications in the case reported by the author are attributed to the underlying infection of the sinus rather than to the accident which occurred at the time of the irrigation.

The following conclusions are drawn:

1. Puncture and irrigation of the maxillary sinus are useful diagnostic and therapeutic measures.

2. It makes little difference whether the irrigation is done through the inferior or the middle meatus. The use of the middle meatus is probably the easiest for the patient.

3. The procedure as formerly employed was not entirely free from danger.

4. While the effect of the anæsthetic used and vagus irritation cannot be entirely eliminated, the chief danger lies in the air inflation rather than the act of puncture or the irrigation.

5. The procedure can be made comparatively safe if the use of air before and after irrigating is avoided.

W. B. Stark, M.D.

Blackwell, K. S.: Carcinoma of the Antrum of Highmore. *Surg. Clin. N. Am.*, 1922, ii, 1445.

The author reports a case of carcinoma of the antrum treated radically as follows:

After multiple ligation of the left carotid and the removal of several lymph nodes for examination, an incision was made over the left superior maxilla,

beginning on the left side of the nose and following the nose around to the midline of the upper lip. The lip was cut through and the flap dissected back. The bony wall of the superior maxilla appeared normal. For exploration, the antrum was opened with a chisel and the opening enlarged. The bone at this point, which was the anterior wall of the antrum, seemed normal. When the opening was enlarged a mass of tumor tissue in the back part of the antrum was exposed. The wound was thoroughly cauterized, and an incision was made below the lower left eyelid from the upper end of the incision along the border of the nose outward for a distance of about 1½ in.

Another incision was made in the mucoperiosteal covering of the hard palate a little to the left of the midline. The bone of the alveolar process and the bone of the hard palate were cut through with bone forceps and the attachment of the lower part of the superior maxilla to the upper portion beneath the orbit severed with bone forceps. The lower portion of the superior maxilla was then removed, the orbital plate being left intact. The tumor occupied the upper and posterior part of the antrum, and seemed to have gone through the bone at one point posteriorly and to the outer side. This extension, however, was not great. The posterior palate bone and all of the soft structures of the palate remained intact. Following the removal of the tumor with the periosteal elevator, the bone and soft tissues were thoroughly cauterized with the Percy cautery. The entire raw surface of the wound was then gone over thoroughly with a sharp electric cautery, and every raw surface was well cauterized to prevent implantation. The septum between the antrum of Highmore and the nasal cavity was completely removed. The cavity was packed with iodoform gauze, and the wound closed with interrupted sutures of fine silkworm-gut. The packing was brought out through the mouth.

The patient made a satisfactory recovery and was discharged November 19, 1921. During the first ten days in the hospital a good deal of slough separated from the burned area.

On March 9, 1922, the patient returned for examination. At the roof of the wound, which corresponded to the back part of the bony portion of the orbit and the tissue immediately beneath it, was an area about ½ in. in diameter which presented a granular appearance. The rest of the wound was smooth and firmly healed, and showed no signs of malignancy. A frozen section was made of tissue taken from this region with a curette, the wound being immediately thereafter disinfected with pure carbolic acid. The section showed cancer of the squamous-cell type. Three needles of radium, each containing 12 mgm., were inserted into this portion, and left in for twelve hours. The patient returned at intervals, and the area of cancer seemed to become smaller.

On June 10, 1922, a small area in this region still presented somewhat the appearance of cancer. A frozen section showed cancer of the same general type as that found at the operation. Sixty milligrams of radium screened in a copper tube were fastened at this point by a linen suture, and gauze was packed so as to hold it in position. The radium was removed after twenty-four hours. A week later there was considerable reaction, not only in the cancerous area, but also in the surrounding healthy tissues. This gradually disappeared, leaving a small surface of necrotic tissue corresponding to the area of the cancerous growth and extending a short distance around it.

When the patient was last seen on August 5, 1922, there was no evidence of recurrence.

O. M. Rott, M.D.

MOUTH

Fischer, M. H.: Some Physiological Principles in Orthodontia. *Internat. J. Orthodont., Oral Surg. & Radiography*, 1923, ix, 16.

Orthodontic procedures should be initiated early as bone absorption and bone deposition occur more quickly and effectively in young structures.

Slow correction is better than quick correction as it is associated with less danger of tooth strangulation and allows bone absorption followed by bone deposition without the hazard of bone necrosis such as invariably follows excessive and too rapidly applied pressure.

Correctures which apply counter-pressure to the jaws are always preferable to those which apply counter-pressure to the individual teeth as the jaws can withstand greater pressure than a tooth movable in its socket. When pressure is applied to the teeth it should be applied to as many of them as possible.

The poor condition of many teeth in infancy is due to disuse. Nourishing food is essential to develop the teeth and bring them into use.

James C. Braswell, M.D.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose

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INTERNATIONAL ABSTRACT OF SURGERY

JUNE, 1923

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Tenckhoff, B.: Hypertonic Glucose Solutions as a Prophylactic Against Injurious Effects of Operation and Anæsthesia (Hochprozentige Traubenzuckerlösungen, ein Prophylakticum gegen Operations- und Narkoseschaeden). *Zentralbl. f. Chir.*, 1922, xlix, 1472.

On the evening previous to a major operation 10 c.cm. of a sterile 10 per cent glucose solution are slowly injected into the ulnar vein. Concentrations of from 20 to 50 per cent may also be used. The only unpleasant after-effect is chilliness. The injection is given the evening before the operation because its optimal effect does not appear until twelve to twenty hours later. The pulse is strong and of good tension after the operation and the curve reaches the same height as before.

The effect upon the anæsthesia is very favorable; the stage of excitation is lessened and may be completely abolished, the amount of anæsthetic necessary is reduced, and nausea and vomiting are prevented. If the injection is not given until after the operation it is of little benefit. WORTHMANN (Z).

Melchior, E.: The Physiology of Wounds (Ueber Wundphysiologie). *Beitr. z. klin. Chir.*, 1922, cxxvii, 138.

Melchior discusses the normal and pathologic physiology of wounds and the biology of healing processes. As a vicarious replacement tissue the most important function of granulations is the provisional closing off of the surface of the body. This is directed partly against the outflow of body juices and partly against the penetration of substances from the exterior.

It has been assumed that the fine cellular processes in wound healing are set in action by hormones which are freed by the decomposition of the tissues in the region of the injury (Bier) and stand in close relationship to a phenomenon designated "cytotropism" (Rous). Disturbances of wound healing include those of a general and those of a local nature. In the former the constitution of the subject and severe general diseases play an important part; also the condition of the endocrine glands. The causes which may contribute toward retardation or prevention of wound healing are therefore extraordinarily manifold. NAEGELI (Z).

ASEPTIC AND ANTISEPTIC SURGERY

Rowell, H. G.: The Surgical Importance of Iodine Idiosyncrasy and Poisoning. *Surg., Gynec. & Obst.*, 1923, xxxvi, 219.

As iodine is a disinfectant for skin and open wounds commonly used by the laity and the medical profession, the author calls attention to the fact that in rare instances a patient may exhibit an idiosyncrasy to the drug, its use being followed by conditions ranging from a local lesion to death.

Reports of iodine idiosyncrasy in the literature deal largely with cases in which iodides were ingested, those in which iodine was used externally being few. It is generally believed that a very small dose can produce the reaction; hence the entry of a small quantity through the skin may be sufficient. Ormsby states that the physical reaction to the drug, and not the dose, is the important factor. Coca maintains that the drug allergy is not essentially different in its underlying mechanism from that of idiosyncrasy toward non-medical substances. The reaction usually appears in a few hours but may be delayed for five to twenty days.

A case reported by Rowell was that of a man 55 years of age who was admitted to the Massachusetts General Hospital for gastric study and with the additional diagnoses of inguinal hernia on the left side and enlargement of the prostate. His history seemed favorable except for an attack of gonorrhœa thirty-three years before, which was followed by gleet. Ten days after his admission to the hospital he was operated upon for chronic appendicitis with hyperchlorhydria. A Bassini repair of the left

inguinal hernia was also done. The patient was given 18 oz. of ether and wide preparation with half-strength tincture of iodine. After the herniotomy a large raised hæmatoma was noted in the abdominal wound. This was opened after a new table toilet and another local application of iodine. A few days later the patient was placed on the "improvement list" but the next day he became irrational and was again placed on the "danger list." Around both the hernia wound and the rectus wound there appeared a purplish color which gradually spread. Death occurred ten days after the operation. Most of the abdomen was purplish, and purplish blebs developed on the lower limbs.

The prognosis depends chiefly on the severity of the symptoms, but is always serious, the mortality being very high.

There is no specific treatment. Starch, the classical antidote for iodine, may be given in solution in the stomach. In the average case the usual methods of increased elimination are logical, and in the purpuric type, at least, transfusion is indicated, often more than once.

On the basis of his investigation the author draws the following conclusions:

1. There is a very definite iodine allergy closely related to, if not the same as, iodine poisoning and iodism, and identical with the toxic effects produced by the iodides, to which iodine is converted on absorption.

2. In cases of allergy the symptoms closely resemble those of poisoning, the chief difference being the amount of iodine producing them.

3. While undoubtedly the condition is rare, the precautions indicated are a carefully taken history and a reasonable effort to prevent absorption by restricting the iodine to a limited area and removing it soon by means of alcohol. The painting of a postoperative wound with iodine has unfortunate possibilities. In doubtful or suspicious cases some other disinfectant should be used.

4. In postoperative cases showing suggestive symptoms, a test should be made for the drug, and if it is found, appropriate treatment should be given, depending on the severity and type of the symptoms.

5. The frequent use of iodine by the laity for the early sterilization of open wounds is associated with possible danger. In the surgery of compound fractures the full-strength solution should be used with discrimination. A careful inquiry with regard to previous reactions will aid in avoiding fatal accidents.

6. In cases with marked idiosyncrasy even painting the skin with small amounts of iodine may cause symptoms.

7. Transfusion, when used, should be repeated whenever the patient is losing ground.

8. Before iodine is used in the case of a patient who has been treated with iodides for syphilis or some other condition, his previous reaction to the drug should be determined.

9. In spite of the efficiency of certain iodine salts as injections for urological X-ray examinations, we must recognize a theoretical danger in their use.

10. In industrial plants where iodine or its fumes are present, workmen sometimes show symptoms of acute or chronic poisoning. Therefore treatment of their injuries with iodine must be potentially dangerous.

11. Iodine need not be discarded as a disinfectant but its removal by alcohol immediately after its application is desirable. GEORGE E. BEILBY, M.D.

ANÆSTHESIA

Wiemann, O.: Clinical Investigations on the Behavior of the Blood Pressure and the Pulse During and After Novocaine-Adrenalin Anæsthesia (Klinische Untersuchungen ueber das Verhalten von Blutdruck und Puls während und nach Novocaine-Suprarenin Anaesthesierung). *Deutsche Ztschr. f. Chir.*, 1922, clxx, 150.

The purpose of the author's investigations was to determine the behavior of the blood pressure and the pulse in an undisturbed operation performed under local anæsthesia. Novocaine-adrenalin solution was used partly for local infiltration and partly for conduction anæsthesia. The pulse and blood pressure (systolic pressure determined with the Riva-Rocci apparatus) were recorded a few minutes previous to the induction of the anæsthesia and the determinations were repeated thereafter at intervals of two minutes. Only those cases were included in the study in which no signs of a general novocaine-adrenalin intoxication were observed during the induction of anæsthesia or the operation, particularly symptoms on the part of the nervous system. The influence of psychic factors was minimized as much as possible by the administration of morphine.

In a number of cases there were no marked changes in the pulse or the blood pressure either during the induction of the anæsthesia or during the operation. a fluctuation in the blood pressure of 20 mm. Hg and a change of twenty beats per minute in the pulse were considered insignificant. In other cases, the anæsthetic caused a considerable increase in the blood pressure and, in some, a considerable reduction. In those in which an increase occurred the pressure rose to 78 mm. between two to thirty minutes after the beginning of the anæsthesia. As a rule the rise was noticed first in from four to six minutes; occasionally, a fall preceded the rise. In general, a rise in the blood pressure, if it was produced at all by the anæsthesia, seemed to occur within the first ten minutes.

The cause of the rise in the blood pressure should be sought in the adrenalin content of the fluid injected. The pressure usually declined again very rapidly, the decrease occurring as a rule from two to four minutes after the highest value was reached; in only a few cases did the high value persist for twelve to fifteen minutes. In isolated cases the blood

pressure rose steplike in response to repeated injections of the novocaine-adrenalin solution. In others, further injections caused no renewed increase, and in some, when the fall in the curve had already begun, it was not interrupted by other injections. On the whole, the blood pressure sank after the initial rise only to the original value, and in the subsequent course of the operation showed only inconsequential fluctuations. In some cases, however, the curve was such that after the initial rise there was a decrease below the original value, in many instances considerably below the original value. From the practical standpoint the question arises as to whether this fall in the blood pressure, which frequently occurs before the operation is begun and reaches its maximum during the operation, denotes a dangerous condition. In the author's opinion it does not as it is not sufficient to cause collapse. Collapse may occur, however, if at the time of the deep fall in the blood pressure operative effects become active, especially hæmorrhage.

Eight cases of splanchnic anæsthesia induced by the Kappis method showed no differences from cases of anæsthesia of another type. STAHL (Z).

SURGICAL INSTRUMENTS AND APPARATUS

Rectenwald, J. J.: A Thoracic Abdominal Gate. *N. York M. J. & Med. Rec.*, 1923, cxviii, 102.

This is an instrument to maintain a permanent opening into the pleura, lung, stomach, liver, colon, cæcum, ovaries, bladder, or uterus. It obviates the necessity for repeated incisions. It is so constructed that it can be introduced into a very small opening, and is held in place by its outer and inner plates. It can be used when it is necessary to treat the interior of an organ repeatedly as for radium applications, instrumentation, etc. MARCUS HOBART, M.D.

SURGERY OF THE HEAD AND NECK

HEAD

Blahd, M. E.: Fracture of the Skull and Its Complications. *Am. J. Surg.*, 1923, xxxvii, 33.

During the last decade there have been unusual opportunities for the study of head injuries because of the recent World War and the constantly increasing number of traffic accidents. While the war injuries were for the most part of a decidedly different nature from those seen in civil practice, the same principles of treatment are applicable to both types.

The author divides cranial and intracranial injuries into three classes: (1) fractures of the skull without brain complications; (2) fractures of the skull with brain complications; and (3) brain injuries without fracture of the skull.

The first class represents the simplest form of skull injury. In such cases the routine X-ray examination is of the greatest importance. Non-interference brings the best results. Unless there is danger of complications, the treatment should never be surgical. To prevent the very serious complication of meningitis, all scalp wounds, however trivial, should be carefully inspected for the presence of a fracture running through the base of the wound. If such a fracture is found, the scalp wound should be excised and the edges brought together without drainage.

The X-ray examination will reveal the presence or absence of depressions involving the inner table or of detached pieces of bone within the brain substance. If a depression is found, it should be raised as soon as the patient's condition will permit the operation. In this procedure it is often necessary to remove a considerable amount of comminuted bone, leaving large defects in the skull. These defects should be closed with a free bone transplant at a later time. It is also imperative to remove bone spicules from the brain substance.

The second classification, that of fracture of the skull with brain complications, and the third classification, that of brain injury without skull fracture, differ only in so far as injury to the bony structures is concerned and therefore may be considered together. The treatment for such cases has been previously described.

Immediate injuries to the brain or its blood vessels are due to laceration, œdema, and hæmorrhage, and remote injuries to gliosis, scar or cyst formation, etc. Modern technique has not arrived at a stage of perfection permitting brain suturing. The second and third causes of immediate injuries, œdema and hæmorrhage, may be considered together as both are apt to produce acute cerebral compression.

Some very illuminating experiments demonstrating the effects of cerebral compression have been performed by Kocher, Hill, Cushing, and others. In man, these experimental phenomena are at times very accurately reproduced by cerebral hæmorrhage or œdema.

Numerous factors enter into the recognition of cerebral compression but a history of injury followed by protracted unconsciousness and increased pulse pressure and the presence of one other symptom is sufficient to establish the diagnosis.

The ideal method of remedying intracranial hæmorrhage would be to ligate the bleeding vessel and evacuate the clot, but this cannot be done as it is still impossible to localize subdural hæmorrhages accurately. Therefore, the treatment must be symptomatic and expectant.

A procedure frequently mentioned in the literature is lumbar puncture. The author states that in cases of this kind lumbar puncture is a dangerous undertaking and as the cerebrospinal fluid quickly reforms its therapeutic value is at least very doubtful.

GEORGE E. BEILBY, M.D.

Graves, S.: Fracture of the Skull Base with Superficial Hæmorrhage on the Opposite Side: Report of an Interesting Autopsy. *Kentucky M. J.*, 1923, xx, 634.

The author reports the findings of the autopsy performed on a man 70 years of age to determine whether the cause of death was fracture or apoplexy. There was a history of chronic nephritis and two attacks of apoplexy.

A linear fracture at the base of the skull was found on the right side extending from the inner end of the sigmoid sinus to the occipital protuberance. There was no hæmorrhage near this fracture but a superficial basal hæmorrhage was discovered on the left side under the frontal and temporal lobes.

There was very little arteriosclerosis and the blood vessels of the brain were not as degenerated as would be expected in a man of this age. The kidneys were cystic and fibrous, and the heart was hypertrophied and dilated.

The author concluded that the death was due to skull fracture, that the hæmorrhage on the opposite side was due to *force contrecoup*, and that the insurance company was liable for death from accident.

MARCUS H. HOBART, M.D.

Sayad, W. Y., and Harvey, S. C.: The Regeneration of the Meninges. *Ann. Surg.*, 1923, lxxvii, 129.

Like the peritoneum, the dura will take care of its own defects and eventually close them over. The question of the formation of adhesions following natural repair of the dura has brought forth divergent opinions. The authors have therefore subjected the healing of the dura to experimental investigation. They carried out their experiments on dogs.

Through a trephine opening in the parietal bone a section of dura was removed, care being taken not to injure the subjacent arachnoid and pia. The dura and bone defect were allowed to fill in with blood clot and the wound closed in layers above it. After a certain time interval the animals were sacrificed, the brain was fixed *in situ*, the tissues surrounding the wound were removed *en bloc*, and the gross and microscopic appearances of the structures were carefully studied. The protocols of eight experiments are given and illustrated by drawings and photomicrographs.

From these experiments the authors conclude that regeneration of the dura occurs by organization of blood clot.

Numerous phagocytes, polyblastic cells, and fibroblasts invade the clot from the overlying temporal muscle to which it is intimately adherent. These cells penetrate through to the arachnoid membrane where they become arranged in a plane tangential to that surface, and after a week there appears a limiting membrane resembling the endothelial lining of the normal dura. Further change is marked by the growth and condensation of connective tissue behind the lining cells.

The cells invading the blood clot always come from the temporal muscle, and adhesions do not form if the arachnoid has not been injured.

The authors conclude that defects made in the dura of the dog operatively without injury to the adjacent arachnoid heal in from one to two weeks and without the formation of adhesions.

V. G. BURDEN, M.D.

Hawthorne, C. O.: Cerebral and Cerebellar Hæmorrhages in Apparently Healthy Adolescents and Children. *Practitioner*, 1922, cix, 425.

The author reports the cases of two boys who died suddenly from cerebral and cerebellar hæmorrhage respectively. The symptoms were similar to those of the apoplexy of adults. Similar cases in the literature are cited, but are relatively few as the condition is rare.

The etiology is very vague, no one cause being determined for all cases. Many theories have been advanced.

The conclusions drawn are as follows:

1. Children and young adults cannot be altogether excluded from the chance of intracranial hæmorrhage.

2. The hæmorrhage may occur at a time when the subject appears to be in good health.

3. The hæmorrhage may cause immediate coma and early death, or may be followed by symptoms suggesting meningitis which persist for several days or weeks.

4. Apparently slight violence may be responsible for apoplectiform symptoms and the latter may be delayed for several days. MARCUS H. HOBART, M.D.

Mogilnitzki, W.: The Parasitology and Pathological Anatomy of Brain Cysticercus (Zur Parasitologie und pathologischen Anatomie des Gehirncysticercus). *Wratschebnaje Djelo*, 1922, iii, 337.

In looking over autopsy material of the Traumatological Institute the author found the following hitherto undescribed case in which a fully developed tænia was discovered in a cysticercus cyst of the brain. On one of the cysts was a very unusual structure 2 to 4 mm. long and 1 to 2 mm. wide which had a broad base and a narrow apex. From a central cavity there radiated from seven to ten lateral branches terminating in small blind sacks. At about the middle was a small irregular nodule. The tissue was made up of round and stellate cells. Careful examination revealed a fully developed tænia.

It is to be concluded that in this case the scolex assumed the rôle of the host. In the human organism there are substances which dissolve the egg envelope of the cysticercus and allow the tænia to develop and it is possible that in status thymicolymphaticus substances are formed in the tissues which change the wall of the cyst. The size of the vesicles (10 to 20 mm.) with typical uteri (7 to 10 lateral ramifications) indicates that this was a case of tænia solium cysticercus cellulosa which had begun to develop into a tapeworm. LUTHER (Z).

Lundberg, S.: Increased Cerebral Pressure with Fat Embolism (Gesteigerter Hirndruck bei Fettembolie). *Acta chirurg. Scand.*, 1922, lv, 237.

Fat embolism is the most common form of embolism because it occurs frequently in fractures of marrow-containing bones and occasionally also in injuries of the soft parts. Only the cerebral form produces the more serious symptoms leading usually to death. A case is reported in which, contrary to previous observations, a marked increase in the pressure of the cerebrospinal fluid resulted.

The patient was a farmer 35 years old who was injured by the trunk of a tree falling on his right leg. A few hours after the injury there was a rise in the temperature to 38.6 degrees C. in spite of the fact that the fracture was uncomplicated. Headache and sleepiness soon developed. The temperature rose still higher and the sleepiness increased to complete coma. Repeated lumbar punctures revealed a pressure of 400, 200, and 300 mm. of water. Neither lumbar punctures nor a venesection caused any improvement. The patient died four days after the injury. At autopsy, very numerous fat emboli and small hæmorrhages were found in the brain. Fat emboli were present also in the lungs, but in smaller numbers.

This was a typical case of cerebral fat embolism ending fatally fourteen days after the injury. The increase in the pressure of the cerebrospinal fluid to 400 mm. of water is of particular interest as up to the present time an increase has been considered a sign indicating the absence of fat embolism. In death from cerebral fat embolism the brain shows hyperæmia, œdema, and hæmorrhages. The requisites for an increase in volume in the cranial cavity are therefore present. Lumbar puncture is an important therapeutic measure. The injury to the brain produced by the pressure is slight in comparison to the primary injury produced by the fat embolism. The assumption is perhaps justified that after the lowering of the intracranial pressure it becomes easier for the blood to carry the fat drops lying in the brain into the general circulation.

SCHUBERT (Z.).

Fay, T., and Grant, F. C.: Ventriculoscopy and Intraventricular Photography in Internal Hydrocephalus. *J. Am. M. Ass.*, 1923, lxxx, 461.

The authors report the case of a boy, 10 months old, who was brought to the hospital by his mother with the request that something be done to check the progressive growth of his head. The child's birth had been difficult, labor having continued for three days before delivery was effected by means of forceps. The mother first noted that the child's head was larger than normal four months later. For the last six months it had been gradually increasing in size. On the child's admission to the hospital his head measured 64 cm. in circumference and 42 cm. from the glabella to the inion. The forehead was massive and the face small. The general physical condition was excellent.

In this particular case the main object of treatment was to establish an outlet through the corpus callosum for the relief of the acute internal hydrocephalus. An approach through the dilated ventricle with an operating cystoscope was suggested. The operation was performed under light anæsthesia. Clear fluid under considerable pressure escaped. The cannula was then removed and a No. 12 cystoscope was inserted to obtain a view of the ventricular walls. The wound was closed after a sufficient amount of fluid had escaped to relieve the pressure. After a slight reaction the child's condition returned to normal in a few days.

Two weeks later a second exploration was performed, this time on the left side, the posterior horn of the ventricle being entered from the parieto-occipital lobe. Only a small amount of cerebrospinal fluid escaped during this operation, evidently because the pressure had been relieved previously. One week later a third operation was attempted, but on account of the fact that the instrument which was to be used for cutting through the corpus callosum was defective, it was not completed. Following this operation there was very little reaction and the child was in excellent condition. A favorable opportunity is being awaited by the authors for the completion of the final stage of the third operation.

From the results obtained thus far the following conclusions are drawn:

1. Intraventricular photography and ventriculoscopy are possible in the presence of dilated ventricles.

2. Little or no reaction follows such a procedure when it is properly conducted.

3. The diagnostic value of direct inspection of the ventricular cavities may prove of considerable importance in determining the location and the extent of subcortical lesions causing deformities of the ventricles.

4. A satisfactory approach with regard to the area and the extent of the opening desired for callosal puncture under direct observation may be made through a dilated ventricle.

5. The photographic reproduction of structures or lesions within the ventricles requires an exposure of at least forty seconds. GEORGE E. BEILBY, M.D.

Davis, L. E.: Lesions of the Paratrigeminal Area. *J. Am. M. Ass.*, 1923, lxxx, 180.

Attention is called to cases characterized by pain in the distribution of the trigeminal nerve wholly unlike the pain of a true major trigeminal neuralgia. These must be accurately differentiated because section of the sensory root will not give relief. They differ entirely from sphenopalatine neuralgia described by Sluder and may be differentiated by placing cocaine on the nasal mucous membrane overlying the sphenopalatine ganglion or directly injecting this structure.

The author reports two new cases and one from the literature in which pain in the distribution of the

trigeminal nerve was due undoubtedly to an intracranial lesion in the area about the gasserian ganglion. In two of these cases there was paralysis of the sympathetic fibers passing from the carotid plexus in addition to pain in the trigeminal area, while in the other the pain in the face was associated with paralysis of the oculomotor nerve. No doubt there are other combinations of nerve involvement which may involve of the gasserian ganglion.

Brewer, G. E.: Carcinoma of the Cheeks and Lips: General Principles Involved in Operations and a Summary of the Results Obtained at the Presbyterian, Memorial, and Roosevelt Hospitals, New York. *Surg., Gynec. & Obst.*, 1923, xxxvi, 169.

In from 2 to 3 per cent of cancer subjects seeking treatment the primary disease is located in the lip. Cancer of the lower lip is about twelve times as frequent as cancer of the upper lip. About 95 per cent of the cases are those of males. The smoking of cigarettes or clay pipes and their contact with the lip for some time constitute a definite etiological factor. There is first a local anæmia caused by pressure of the pipe stem on the lower lip; second, an irritating effect produced by the nicotine and the products of combustion, carbon monoxide and carbon dioxide forming carbonic acid with the water of the mouth secretions; and third, the direct action of the heat. Other etiological factors are seborrhœic keratoses and small papillomata, which not infrequently are found on the lower lip; irritation from diseased teeth or poorly made plates; cracks in chapped lips; leucoplakia; herpes labialis; minute cuts from shaving too closely along the mucocutaneous border; direct blows; and the stings of insects. All are causes of more or less constant irritation.

Three different types of malignant disease occur in the lip: (1) the squamous epithelioma, (2) the basal-cell epithelioma, and (3) sarcoma.

In cancer of the lower lip lymphatic extension is almost invariably observed first in the submental nodes. From these it extends to the submaxillary group, thence to the upper group, and finally to the lower cervical groups, both superficial and deep.

In cancer of the upper lip the submental nodes are often not involved, the disease being carried first to the nodes adjacent to the submaxillary salivary gland or to the upper deep cervical group. The primary lesion always appears on the cutaneous side of the vermillion border.

From an analysis of 537 cases divided into four groups, depending chiefly upon the degree of differentiation of the cells and the number of mitotic figures, Broders found that in Group 1, which showed the greatest degree of differentiation but no mitotic figures, the cures were 100 per cent, while in Group 4, which showed the opposite microscopic picture, the percentage of cures was reduced to zero.

Volkmann's rule that a three-year period of freedom from recurrence constitutes a cure in cases operated upon for cancer is no longer tenable.

Recent statistics from several clinics show that a five-year cure was obtained in 66 per cent of the cases in Group 1 in which only the primary lesion was removed, in 92 per cent of those in Group 2 in which the primary lesion and the anatomically related submaxillary lymph structures were removed, but there was no lymph-node involvement, and in 34 per cent of those of Group 3 in which the primary lesion and related lymph nodes were removed and there was positive evidence of involvement of the lymph nodes.

Cancer of the cheek is a rare and exceedingly malignant disease which quickly spreads to the upper and lower jaw and the adjacent structures of the mouth and soon involves the cervical lymphatics. In all but the earliest cases radical surgical treatment requires an extensive, disfiguring, and dangerous operative procedure and offers little hope of a permanent cure.

In cases of cancer of the lip the results of surgical treatment are far superior to those as yet obtained with radium, but in cancer of the cheek radium gives better results than surgery. MORRIS H. KAHN, M.D.

Esser, J. F. S.: Rotation of the Cheek (Die Rotation der Wange) *Muenchen med. Wchnschr.*, 1922, lxix, 780.

The principle of rotation of the cheek, whereby various kinds of defects of the face—in the cheek, eyelids, nose, and lips—can be corrected, depends, not upon the formation of a pedicled flap, but upon mobilization of the entire cheek by means of a curved incision extending to a point low down on the neck. The part so mobilized is then turned into the defect on an axis in the center of the cheek. At the end of the curved incision a vertical incision 2 cm. long is made upward. In this way the rotating cheek is rendered more movable and the surrounding wound edge can be lengthened by about 4 cm. by pulling the incision apart. The secondary defect is sutured.

Among the advantages attributed to the method are the ease of its application and the good nerve and vascular supply of the rotated portion whereby necrosis and the danger of infection are eliminated. As the method can be used when the defect is still unclean and not healed, the correction of the defect should be undertaken as soon as possible so that the disadvantages of cicatrization—the formation of neuromata and disturbances of circulation, sensibility, and motility—may be avoided. An additional advantage of the procedure is the unobtrusive cicatrization. It is most important not to injure the facial nerve or Stenson's duct. After the skin is divided, therefore, the deeper tissues should not be attacked, the skin being undermined only toward the cheek and the cheek mobilized with the knife only as much as is absolutely necessary. Often the entire portion can be made very mobile by traction. The suturing is begun by closing the defect in the neck. The outer wound edges are first drawn downward so that they are brought together and may be

easily sutured to one another. With every stitch the anterior edge of the wound is drawn upward. In order to relieve the tension, the patient is put in a position in which the head is inclined toward the shoulder on the side operated on.

The entire nose may be replaced by bilateral rotation, in which case the one side is used as an inner lining and the other for the outer skin. No dressing is necessary. FISCHER (Z).

Judd, E. S., and New, G. B.: Carcinoma of the Tongue: General Principles Involved in Operations, and a Summary of Results Obtained at the Mayo Clinic. *Surg., Gynec. & Obst.*, 1923, xxxvi, 164.

A study of the records of patients suffering from cancer of the tongue shows that often the disease originated as an obscure or benign lesion and that this was only superficially treated, if it was treated at all. Leucoplakia, thrush, syphilitic gummata or scars, cracks, ulcers, fibromata, and papillomata are of such common occurrence as to indicate that they have some causal relationship to the malignancy. Often it is possible to demonstrate the coincidence of the benign and malignant conditions in the same lesion. A high incidence of syphilis has been noted, and many patients who have responded to treatment for syphilis have been carried into a hopeless condition of malignancy because the double lesion was not recognized. In making examinations, this possibility should be kept constantly in mind. In some of the cases, because of previous treatment, the differential diagnosis may be established only with great difficulty. If other possibilities have been excluded and there is still doubt with regard to the presence of malignancy, biopsy should be made. An area of tissue at the margin of the lesion should be removed at the juncture of the normal epithelium and the ulcer, not at the base. Even after this procedure a negative report or a report of "inflammatory tissue" should not be considered final.

From January 1, 1910, to January 1, 1922, 303 patients with cancer of the tongue were examined in the Mayo Clinic. One hundred and eighty-five (61.05 per cent) were considered inoperable; therefore fewer than 40 per cent were operable. The variation in the statistical results in any series of cases is dependent largely on what is considered operable and what is considered inoperable, and the ultimate results following operation, as a series, should not be compared with a series made up entirely of early cases. Early cases almost invariably progress well; in advanced cases the results are less favorable, but a certain number can be cured and should be given this chance.

The types of treatment for cancer of the tongue may be classified as: (1) cautery excision, (2) cauterization, (3) excision with the knife, (4) the Kocher operation, and (5) removal of the glands and the local application of radium. In the cases reviewed the operative procedures varied somewhat, but the general principles were much the same. In most instances the two-stage operation was performed, the first stage consisting of removal of the cervical lymph nodes. If these nodes were found to be involved, a complete block dissection on the affected side with removal of the submaxillary and the upper part of the deep cervical glands on the opposite side was usually carried out. If the glands were not affected, the submental, the submaxillary, the upper part of the deep cervical, and the glands in front of the internal jugular vein were removed. After these wounds had healed, the lesion of the tongue was removed by wide excision extending well into the tissue that appeared normal.

The functional results were as good following a fairly wide removal as a more limited removal; nothing is added to the risk of the operation by the more radical procedure. Excision by cautery is preferable, but in cases of extensive involvement in the floor of the mouth the Percy cautery was sometimes used. In seven cases the lesion on the tongue was treated with radium and the glands were removed; the local lesion was too extensive for satisfactory excision. The Kocher operation was performed in six cases because of extensive involvement of the tissue in the floor of the mouth. Several of these patients lived comfortably for a time, but died eventually of recurrence.

The percentage of recurrences following operations for cancer of the tongue is high largely because many patients are not operated on until an advanced stage of the disease. The tip of the tongue is a favorable site for the tumor; many tumors are found on or near the lateral border. Treatment is more satisfactory when the lesion is on the dorsum and does not encroach on the mucous membrane of the floor of the mouth. Lesions at the root are difficult to treat and the results are the least satisfactory. The greater number of such patients present themselves for treatment between the ages of 45 and 60 years. If no treatment is given, the average length of life is about one year.

In fifty-two of the 118 operable cases the lymph nodes were affected at the time of operation; in sixty-six the lymphatics were free. Recent reports from nearly 80 per cent of these patients revealed that 30.85 per cent were free from the disease for more than three years, 24.46 per cent for more than five years, 7.44 per cent for more than eight years, and 4.25 per cent for more than ten years.

The article is summarized as follows:

A reduction in the number of cases of cancer of the tongue depends on early recognition and proper treatment of precancerous lesions. Lesions of the tongue suspected of being malignant should be excised for diagnosis and should not be treated locally.

Improvement in the end-results of treatment of cancer of the tongue depends on diagnosis and proper treatment in the early stages of the disease.

In the light of present knowledge, all patients with operable cancer of the tongue should be given the benefit of surgery. Radium also should be employed in order to give them every possible chance.

Crile, G. W.: Carcinoma of the Jaws, Tongue, Cheek, and Lips: General Principles Involved in Operations, and a Summary of the Results Obtained at the Cleveland Clinic. *Surg., Gynec. & Obst.*, 1923, xxxvi, 159.

In only 1 per cent of 4,000 autopsies for cancer of the head and neck were secondary foci found in distant organs. The lymphatic collar about the neck seems to prevent inaccessible dissemination of the cancer in this region. Cancers of the skin, of the mucous membrane of the edge of the jaw, and of the mucous membrane of the cheeks do not metastasize as a rule. Cancer of the lip metastasizes to the lymphatic glands under the jaw, while cancer of the floor of the mouth usually forms metastases in the glands of the same side. Cancer of the tongue metastasizes irregularly.

The surgical treatment varies with the region affected. Early cancer of the gum or cheeks does not require excision of the glands. Cancer of the lip demands excision of the glands draining the involved area, while cancer of the tongue necessitates a bilateral block dissection of the glands. In advanced cases, wherever the original lesion, a wide regional block excision is indicated.

Bronchopneumonia must be prevented by preventing the inhalation of blood and wound secretions. Light anæsthesia induced by means of rubber tubes passed through the nares is desirable. Deep ether or chloroform anæsthesia is dangerous.

The reseeding of the cancer can be minimized by wide excision and thorough hæmostasis. In certain cases the cautery should be used for removing the primary focus. In operation for cancer of the buccal mucous membrane a piece of the underlying bone should be removed with the growth. A single treatment with deep X-rays should be given after operation.

The author reports 224 cases of carcinoma of the buccal surfaces with six operative deaths.

J. A. H. Maggots, M.D.

NECK

Maximowitsch, B.: Tumors of the Parathyroid Gland (Zur Kasuistik der Tumoren der Gland. parathyreoidea). *Medic. Shornik Jekaterinoslawskawo Gubsdrawa*, 1922: 28.

The author presents a brief review of the literature and a report of a case. The case was that of a 35-year-old farmer who, for a year, had had an enlargement of the submaxillary glands on the left side and a round tumor in the middle of the neck, measuring 9 by 7 cm. The tumor moved when the patient swallowed, and was hard. Enucleation of the tumor from the thyroid was followed later by the removal of the glands of the neck. One and one-half years later metastases appeared in the axillary glands and the lungs.

Microscopic examination demonstrated a histogenetic relationship between the tumor and the parathyroid. The microscopic findings are described in detail. The histologic picture showing energetic proliferation of cells suggested malignancy. The epithelial cells varied decidedly in size and form, and there were many transitional forms. Schaack, Z.

Benedict, F. G.: The Basal Metabolism of Young Girls. *Boston M. & S. J.*, 1923, clxxxviii, 127.

The author reports a series of determinations made on two groups of Girl Scouts, 14 and 18 years old respectively, to establish normal standards of basal metabolism for these ages. The work was carried out by the group system of metabolic study, which is better than individual study as it yields a considerable number of results in a comparatively short time. Only the carbon-dioxide estimation was made. The work represents the metabolism of that portion of the day so essential to young girls, i. e., the period of sleep.

The average heat production computed per individual per ten hours during bed rest was 550 calories for the 18-year-old group and 568 calories for the 14-year-old group. The basal heat production per twenty-four hours was computed as 1,253 calories for the 18-year group and 1,314 calories for the 14 year group.

Repeated tests have shown that the formula devised by J. A. Harris and the authors for predicting the basal metabolism of adult men applies with practically the same degree of accuracy to boys down to the age of about 1 year, but the formula for women cannot be applied as accurately to girls. Even when the formula for women is restricted to the adult ages, the deviations in the actually measured metabolism from the predicted metabolism are very great.

S. F. Adams, M.D.

Holman, E. F.: Hypoglycæmia in Exophthalmic Goiter: A Preliminary Report. *Bull. Johns Hopkins Hosp.*, Balt., 1923, xxxiv, 69.

Glycæmia in cases of deranged thyroid function has been the subject of considerable study. Observations point to a hyperglycæmia with diminished sugar tolerance in cases of severe hyperthyroidism but have not been made in the period immediately following operation for exophthalmic goiter.

The handling and manipulation of the gland in the course of an operation for severe thyroid intoxication results in flooding the general circulation with a considerable amount of thyroid secretion. The immediate effect of this active substance is a tremendous increase in the metabolic processes of the body, all the available carbohydrates being utilized. It is logical to suppose, therefore, that if sufficient active thyroid secretion is taken up by the circulation, there will come a moment when the available carbohydrate supply in the body is exhausted and hypoglycæmia supervenes.

The author cites a case of very marked hyperthyroidism in a woman on whom thyroid resection was done. A very severe reaction set in immediately after the operation and continued throughout the next

sixty hours (pulse 180-200). Twenty-four hours after the operation the patient was in a semi-stupor with a temperature of 102.4 degrees F., tachycardia, extreme restlessness, evidence of marked weakness, and shallow rapid breathing. The blood sugar was found to be .048 gm. per 100 c. cm. (normal .09 to .110 gm. per 100 c. cm.).

Glucose was given very slowly intravenously (40 gm. in a 20 per cent solution). An immediate improvement in the patient's condition was evidenced by her response to questions. Six hours later her condition again became desperate. Stupor developed; her color became ashen pale, her respirations very irregular. There was a constant mucous rattle in the throat. The pulse was 180.

A second injection into the vein of 50 gm. of glucose in a 20 per cent solution was given. Again there was an immediate response by an improvement in color and regular respiration, but without return to complete consciousness as before. This improvement was not well sustained during the next six hours, but from this point on there was gradual betterment eventuating in complete recovery. Ten hours after the second administration of glucose the blood sugar was .119 gm. per 100 c. cm. With the exception of the specimen taken the morning after the operation, the urine during the two days was negative for acetone bodies. It seems evident that in these cases we are dealing with a hypoglycæmia rather than an acidosis, and that the latter condition is probably incident to the first.

Other observations have been made which reveal a marked reduction in blood sugar appearing twenty-four to twenty-six hours after operation and corresponding to the postoperative period when the greatest reaction occurs.

The rationale of the administration of glucose solution intravenously is suggested by these few studies, controlled and dependent upon successive blood-sugar determinations. The author emphasizes the importance of a high carbohydrate and high caloric diet in the pre-operative treatment of exophthalmic goiter and the administration of 5 per cent glucose solution per rectum in the postoperative care. ARTHUR L. SHELTFLER, M.D.

Floercken, H.: The Method and Technique of Operation for Goiter (Ueber Methodik und Technik der Kropfoperation). *Beitr. z. klin. Chir.*, 1922, cxxvii, 85.

Up to January, 1922, Floercken operated on 263 cases of goiter coming from Westphalia and Frankfort. These included thirty-one cases of Basedow's disease and five cases of malignant struma. The rest were diffuse and nodular goiters. Hypertonia with polycythæmia was found.

A bilateral resection with ligation of all of the four vessels was done in ninety cases. In sixty cases only three vessels were ligated. In the remainder, hemistrumectomy with or without removal of the isthmus or combined with enucleation or partial resection of the other side was done. In one severe case of Basedow's disease only three vessels were ligated.

Goiterous patients with cardiac disturbances are prepared by bed rest, digitalis, and 0.5 gm. of quinine hydrobromide twice daily. The operation is always done under local anæsthesia induced with 0.5 per cent novocaine-adrenalin solution preceded one hour before by pantopon and scopolamine or morphine and atropin. The collar incision of Kocher is used. In cases of large goiters and those previously treated by iodine rubbing or X-ray irradiation the muscles of the neck are divided as much as necessary. The superior artery is ligated, not at the main stem, but in its branches, in order to spare the superior laryngeal artery, a vessel important for anastomosis. The inferior branch is ligated with catgut where it crosses the carotid artery. A portion of the thyroid gland as large as a thumb is left behind with the posterior capsule, which is sutured from above downward. A drain is left in for two days. The formation of a hæmatoma and serum occurs in 10 per cent of the cases.

The author's total mortality was 1.9 per cent. Slight postoperative tetany occurred once. It is not yet known whether bilateral resection with ligation of three vessels is sufficient. In Basedow's disease, bilateral resection with ligation of all four vessels is the operation of choice. KLOSE (Z).

Dahmann, H.: An Unusual Case of Carcinoma of the Larynx: Pedicled Carcinoma of the Larynx (Ein seltener Fall von Larynxcarcinom: gestieltes Larynxcarcinom). *Ztschr. f. Laryngol., Rhinol., etc.*, 1922, xi, 102.

A case of pedicled carcinoma of the larynx springing from the right aryepiglottic fold is reported. The tumor reached the size of a hazelnut without showing any tendency to degeneration. The larynx itself was practically uninvolved, even at the site of the attachment of the tumor, but there were metastases in the glands on the right side of the neck and involvement of the jugular vein and the carotid artery.

The tumor was extirpated with the aid of suspension laryngoscopy, the glands were removed, and the jugular vein was partially resected. Because of the patient's age (58 years), the carotid artery was spared. Irradiation was given after the operation.

Up to the present time only five similar cases have been reported. MINNIGERODE (Z).

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Lipin, S.: Post-Typhus Fistulæ of the Ribs (Ueber posttyphoese Fisteln der Rippen) *Wratschebnaye Dielo*, 1921, iii, 249.

During the typhus and relapsing fever epidemic many cases of disease of the costal cartilages were observed. They were especially numerous following relapsing fever. In forty-three cases there were only two in which relapsing fever was not mentioned.

The process begins with pain in the wall of the thorax. This is soon followed by an infiltration which in most cases results in perforation and the formation of persistent fistulæ. The condition begins in from two to three months after the drop in the temperature, often involves several ribs, and is frequently bilateral. As a rule it attacks the fifth and ninth ribs, never the lowest ribs.

In the differential diagnosis tuberculosis is the first condition to be considered. This is eliminated chiefly by the history. Tuberculosis is characterized by the absence of definite pain, the rarity of multiple lesions, the marked pus formation, a long fistula (in the post-typhus form the fistula usually opens directly over the ribs), the small extent of the focus, and the absence of ossification.

Conservative treatment gives no results. When a fistula is formed it must be operated on. The author is convinced that curetting alone will not help; the cartilage must be resected. At operation the condition is often found to be extensive. Frequently the margins of the sternum and the bony ribs are also involved. VON HOLST (Z).

Eggers, C.: Chronic Empyema. *Ann. Surg.*, 1923, lxxvii, 141.

Eggers divides cases of chronic empyema into two main groups, the avoidable and the unavoidable. Those classified as avoidable are the result of gross errors in judgment, failure to recognise causes, or failure to apply correct surgical principles. The unavoidable cases are those resulting from acute empyema which, from the beginning, showed a tendency to become chronic or in the course of treatment developed conditions which were not easily avoided and were beyond control.

In this article the author reviews 192 cases which represent a large part of the empyema residue of the U. S. Army in this country and that brought from abroad. As these patients received much the same treatment as their fellows who recovered promptly, an effort was made to determine the factors causing the delay in recovery.

In 172 of the 192 cases the empyema followed a secondary pneumonia. In the cases in which the original organism was reported, the hæmolytic streptococci were found in sixty-two, pneumococci in six, and staphylococci in three. From these findings Eggers concludes that empyema following secondary pneumonia, especially one in which the primary organism is the streptococcus, is more apt to become chronic than empyema following lobar pneumonia and due to the pneumococcus. However, careful investigation always brought to light some local and usually mechanical factor which was responsible.

A few of the cases included in this report were those of patients who had an old unrecognized empyema for many months. These may be placed in the "avoidable" group. Thorough examination, including X-ray examination, should be the routine practice before discharging persons convalescent from pneumonia.

From a study of many cases of acute empyema it appears that healing usually takes place in from one to three months. The convalescence tends to be shorter when the condition follows typical lobar pneumonia than when it follows a secondary or bronchopneumonia. When drainage continues longer than usual, a search should be made for the cause of the delay in healing. It may not be necessary to change the treatment, but if a condition interfering with healing is found, it should be removed.

The causes for delay of healing have been classified into two groups. In the first group are the causes of chronic superficial fistula. In such cases the empyema cavity was obliterated but some local condition in the chest wall prevented healing. Investigation of the sinus tract disclosed epithelialization of the drainage canal, infected granulations along the tract, osteomyelitis of a rib, or a fistula leading to infected cartilage. The usual appropriate surgical procedures were sufficient to clear up the condition except in cases with infected cartilage, in which resection of the fistulous tract with the entire cartilage was found necessary.

In the second group are included the causes of deep chronic empyema fistulæ, cavities, and recurrences. These are really different stages of the same condition. In the cases reviewed the causes of chronicity were found to be one or more of the following conditions: contraction of the drainage opening; improperly placed drainage opening; pockets and recesses—separate cavities; infection of the lining membrane of a cavity; a rigid unyielding wall of a cavity; pneumothorax; bronchial fistula; foreign bodies; tuberculosis; Dakin solution; or a general constitutional condition.

To treat the condition intelligently, a thorough and careful study of the case must be made. This should include consideration of the type of pneumonia and the possibility of associated tuberculosis, lung abscess, or bronchial fistula, and an investigation of the position and extent of the fistulous tract and cavity. The study of the fistulous tract and cavity is not complete without a thorough X-ray examination of the chest, including stereoscopic plates taken with

the fistula and cavity injected with some opaque fluid. The mixture Eggers found most satisfactory consists of 20 per cent bismuth subnitrate in cottonseed oil to which 5 per cent acacia is added.

Most of the so-called complications of chronic empyema are in reality complications which developed during the acute stage and were carried over into the chronic stage. The most common of these is anæmia. Among the other true complications the most important are endocarditis, myocarditis, and multiple arthritis.

Treatment to improve the general health should be coincident with attention directed to the local condition. Nourishing food, fresh air, and sunshine, graduated breathing exercises, and encouragement of a general hopeful attitude constitute the essentials. The local treatment depends upon the condition found upon the patient's admission to the hospital. Eggers uses the Carrel-Dakin treatment in all cases, at the same time correcting the underlying conditions. While he does not believe that Dakin's solution materially shortens the course of the disease in the acute form, he is of the opinion that it has certain advantages. It keeps the wound clean and does away with foul-smelling pus, thereby preventing the absorption of septic material. With regard to chronic empyema, on the other hand, Eggers believes it has a beneficial effect. He advises the regular routine recommended by Carrel. After seven consecutive negative cultures, the treatment may be discontinued and the wound sealed. At the end of a week, it is usually found nearly closed. After this it requires only simple sterile dressings. During the period of irrigation special care must be taken to arrange the dressings so as to keep the patient dry and prevent skin irritation. In a few of the cases reviewed, nausea, arthritis, and an unexplainable elevation of the temperature occurred but disappeared when the irrigation was discontinued.

Of the 192 patients, twelve had a superficial fistula and were treated by complete excision of the tract and surrounding tissues. The others were treated by the Carrel-Dakin method as long as there was reason to believe it would lead to healing. In sixty-two cases which showed no tendency to heal, conditions interfering with healing were found. The patients were therefore subjected to a radical operation.

Of the remaining 118, 104 healed in an average of one hundred and sixteen days from the last operation and fourteen were transferred unhealed. In these unhealed cases the chances for healing were good; they merely required more time, and were therefore not operated upon. McMicken Hanchett, M.D.

Sadlier, J. E.: A Study of the Cases of Carcinoma Mammæ Operated upon by Myself and the End-Results Obtained in Them. *Surg., Gynec. & Obst.*, 1923, xxxvi, 235.

The author reports upon a series of seventy cases of carcinoma of the breast occurring over a period of twenty years. All of the operations were of the radical type including resection of the axillary and supraclavicular glands when indicated. Some hopeless cases were submitted to operation unnecessarily. This could be remedied if a thorough X-ray examination of the mediastinum, lungs, etc., were made prior to operation to discover evidence of lung involvement.

Twenty-three of the patients (32.85 per cent) are alive and free from recurrence, and 14.2 per cent died from other causes without recurrence, making a total of 47.05 per cent in whom the disease did not recur.

The author cites two cases which demonstrate the variability in cancer malignancy. One was that of a woman 32 years old who was subjected to a radical operation three weeks after she first noticed a lump in her breast but died of metastasis six months later. In this case a simple removal would doubtless have accomplished as much as the radical resection. The second case was that of a woman 65 years of age who, for three years, had a growing lump in the breast associated with axillary involvement, great emaciation, and ulceration and breaking down of the tumor. This patient was completely cured and died ten years later of pneumonia.

The author is of the opinion that a good many tumors considered recurrences are in reality new growths. In this connection he cites the case of a woman aged 60 years who had a radical resection of the breast for medullary carcinoma. Six years later she was operated upon for malignant disease of the urinary bladder. She recovered but ultimately died of carcinoma of the liver. The type of cell was different in each cancer.

Nine of the seventy patients whose cases are reviewed were under 40 years of age. Eight of these died of recurrence.

The prognosis seems best for the adenocarcinoma. That of the medullary type is least favorable.

William J. Pickett, M.D.

Morton, C. A.: Malignant Diseases of the Breast: With Special Reference to the Supraclavicular Extension of the Operation. *Brit. M. J.*, 1923, i, 178.

This article is a study of 251 cases of malignant disease of the breast in Morton's personal experience. Of these, 242 were cases of glandular cancer, most of them of the scirrhous type, three were cases of very much less malignant duct cancer, and six were cases of sarcoma. In order to ascertain the late results, an attempt was made to trace 120 consecutive patients treated in the period between October, 1908, and October, 1918. As the survey was carried out in 1922, the minimum period following operation was three years. Of the 120 cases Morton was able to determine the late results in eighty.

His desire was to discover the percentage of cases in which there was local recurrence, because only this form of recurrence could have been prevented by more extensive operation. By local recurrence Morton means recurrence in the pectoral region, including not only the region originally occupied by the

breast, but also the infraclavicular region, the lateral aspect of the chest below the axilla, and the region over the sternum; the axilla; the supraclavicular region; and the skin of the back of the chest on the side of the operation.

Of the eighty patients traced, thirty seven (46 per cent) were free from recurrence three or more years after the operation. One was known to be free from recurrence four years after the operation; five, five years; two, six years; two, seven years; four, eight years; seven, nine years; two, ten years; and three, eleven years. In thirty-four of the thirty-seven cases the clinical diagnosis of carcinoma was confirmed microscopically, in two others the gross appearance was typical, and in one a microscopic diagnosis of round-cell sarcoma was reported by one pathologist and a diagnosis of endothelioma by another. In forty three cases there was local recurrence suggesting the possibility that the primary operation should have been more extensive.

The majority of the recurrences developed in the skin or the subcutaneous tissue over the remains of the great pectoral muscle. The next most frequent site was the supraclavicular region. Seven recurrences developed in the axilla and two in the skin of the back between the scapulæ. There was no case of recurrence in the skin between the original position of the breast and the upper abdomen, though no special clearance of tissues in this direction was made. No particular portion of the pectoral area was more often affected than any other.

Since 1902 Morton has removed the fatty tissue and contained glands from the supraclavicular region in 126 cases in which no glands were discoverable before operation. In twenty other cases he removed cancerous nodules. Of the 126 supraclavicular extensions of the operation, ninety were among the 120 cases investigated for local recurrence. Of these cases, eighty-four showed no evidence of metastasis above the clavicle before operation and yet in twenty the growth recurred in this region. The local growth was removed, or was removable and could have been removed but for the presence of an irremovable recurrence elsewhere.

There is no special guide as to when the supraclavicular extension of the operation is indicated. Morton concludes that it should be carried out as a routine procedure unless the primary growth is very small and the axilla absolutely free from evidence of secondary growth. In some cases it may be omitted when there is a special contra-indication, such as advanced age. However, he reports no increased shock associated with the more extensive operation.

McMicken Hancrett, M.D.

Calrer, L.: Local Recurrence Following Extirpation of Carcinoma of the Breast (Ueber die lokalen Rezidive nach Exstirpation des Mammacarcinom). *Gynäkologie*, 1922, 124.

In mammary carcinoma the cancer cells reach the lymph nodes in the axilla by way of the superficial and deep lymphatics. The lymphatic vessels running from the breast to the axilla contain cancer cells even in the early stages of the disease. Accordingly, the skin over the lymphatic vessels must be as cancerous as that immediately surrounding the primary tumor, and at operation an attempt should be made to avoid cutting into this portion of the skin or the tissues under it.

The author considers all the skin incisions used today in amputation of the breast as unsuitable because they penetrate the dangerous area. He recommends a T-shaped incision, the horizontal branch of which corresponds approximately to the deltoideopectoral sulcus, and the vertical branch, consisting of two incisions, encloses the skin extending from the breast to the axillary space. The main advantage of this form of incision consists of the fact that the portion of skin over the superficial and deeper lymphatics leading to the axillary space remains intact and is removed with the deeper layers.

Von Lobmayer (Z.).

Hintze, A.: Recurrences of Carcinoma of the Breast Which Developed After a Clinical Cure Lasting Five Years or Longer Following Treatment with the Roentgen Ray (Mammacarcinomrezidive nach Roentgenbestrahlung 5 Jahre und mehr klinisch geheilt). *Klin. Wchnschr.*, 1922, 1, 2187.

The author reports four cases of late recurrence of carcinoma of the breast. Briefly, these were as follows:

Case 1. The patient was a woman aged 48 years. Amputation of the right breast was done in October, 1916. The axillary glands were irradiated in December, 1916, and a nodule in the operative scar was irradiated in April, 1917. In January, 1921, another nodule appeared in the scar. Histologic examination showed this to be a fibro-adenoma. It was removed, but in April, 1921, a similar nodule appeared in the same spot.

Case 2. The patient was a woman 44 years old. Amputation of the left breast in July, 1913, was followed by prophylactic irradiation. In December, 1914, a recurrence developed in the scar but disappeared promptly on roentgen treatment. Since 1920 there have been hard glands in the right axilla but operation has been refused. The patient's general condition is good.

Case 3. The patient was a woman 57 years old. Amputation of the left breast was done in January, 1915. In July, 1915, there was slight swelling of the supraclavicular glands on the left side; no change followed irradiation. For more than seven years the findings have remained the same. The general condition is good.

Case 4. The patient was a woman 42 years old. Amputation of the left breast was done in April, 1916. In May, 1916, irradiation was given. In November, 1919, a nodule the size of a pea appeared in the scar. This was removed and the area irradiated. Since December, 1921, small supraclavicular glands have been noted.

Wohlgemuth (Z.).

Jackson, C.: Bronchoscopic Clinic: Lung Suppuration Caused by the Prolonged Sojourn of a Foreign Body. *Med. Clin. N. Am.*, 1923, vi, 999.

Jackson reports four cases of foreign body in the bronchi to emphasize the following points:

Foreign bodies in the bronchus cause lung suppuration simulating lung abscess, bronchiectasis, tuberculosis, empyema, bronchopneumonia, or chronic bronchitis.

The signs as well as the symptoms clear up with surprising rapidity after the removal of the foreign body. Almost invariably the foreign body is found at the entrance to the area of lung suppuration. Hence its removal improves drainage.

In the cases reported in this article, as in hundreds of others, the foreign bodies were removed with ease and alacrity by means of the bronchoscope.

The length of time the foreign body had remained in the bronchus in Jackson's cases ranged from a few weeks to thirty-six years. In most cases its presence had not been suspected. When a foreign body is radiotransparent, attention may be called to it by the obstruction emphysema. If a foreign body has been present a long time the signs of lung suppuration will be noted. Some radio-opaque bodies will escape detection because of the over-lying shadows of the heart or of lung suppuration.

When a previously healthy child has a sudden attack of choking and coughing followed later by bronchitis and asthmatoid wheezing an aspirated foreign body should be sought.

RALPH B. BETTMAN, M.D.

Hauser, G.: Pyopneumothorax (Zur Lehre vom Pyopneumothorax). *Frankfurt. Ztschr. f. Path.*, 1922, xxviii, 501.

On the occasion of the fourteenth meeting of the German Pathological Society the author exhibited a series of frozen sections of the thorax preserved by the Kaiserling method and pointed out their significance. Such sections are particularly valuable to demonstrate the conditions of pneumothorax. This article contains an illustration of a frozen section made in a case of exudative pneumothorax of the most extreme grade occurring in a man 23 years old who had a family history of tuberculosis and died of tuberculosis. The diagnosis of exudative pneumothorax was verified by the distinct splashing noise noted when the upper part of the body was shaken. Autopsy showed extensive intestinal and mesenteric tuberculosis. The cross section of the frozen thorax revealed advanced pulmonary tuberculosis with the formation of cavities and a rupture into the right pleural cavity in which an exudative pneumothorax had developed. The exudate, amounting to about 3.5 liters, had pushed the diaphragm downward and caused marked displacement of the mediastinal organs to the left. The diaphragm formed an almost straight line rising obliquely upward from the right side to the left. The displacement of the mediastinal organs was so great that in the region of the heart the vertebral column could be grasped from the right pleural cavity. Other interesting features were an indentation of the wall of the right auricle and kinking of the ascending vena cava.

The specimen shows clearly how the so-called tamponade or choking of the heart may be produced, not only by effusion in the pericardium, but also by effusion in the right pleural space. It demonstrates further, at a single glance, the results of the serious functional disturbances caused by the anatomical and topographical changes of the thoracic organs, viz.: (1) extreme difficulty in the gaseous exchange in the lungs, and (2) extreme difficulty in, and eventually arrest of, the circulation due to compression of the right auricle and kinking of the ascending vena cava.

GLASS (Z).

Goetze, O.: The Radical Phrenicotomy as an Independent Therapeutic Measure in Unilateral Pulmonary Phthisis (Die radikale Phrenicotomie als selbstaendiger therapeutischer Eingriff bei einseitiger Lungenphthise). *Klin. Wchnschr.*, 1922, i, 1496, 1544.

The author reports on the severe cases of pulmonary tuberculosis treated by unilateral phrenicotomy at the Frankfort clinic. He emphasizes the harmlessness of the procedure. The diaphragm is paralyzed in such a way that total atrophy of the muscle follows. As a result of this paralysis, the diaphragm rises more and more into the position of expiration. At the same time, the thoracic cavity is diminished in its vertical direction as a result of the shrinkage of the diseased lung.

Goetze obtained surprisingly good results in his own cases. He states that the phrenicotomy should be done with the induction of the pneumothorax.

JEHN (Z).

Ostermeyer, K.: The Mobilization of the Entire Shoulder Girdle as an Aid to Thoracoplasty for Pulmonary Tuberculosis (Die Mobilisierung des ganzen Schulterguertels als Hilfsmittel bei der Thorakoplastik wegen Lungentuberkulose). *Zentralbl. f. Chir.*, 1922, xlix, 1504.

To mobilize the shoulder girdle from the thorax to facilitate approach to the first rib the author makes a Z-shaped skin incision from the sternal end of the clavicle to the vicinity of the insertion of the pectoralis major muscle on the humerus, from there along the outer lower border of this muscle almost up to the costal arch, and from there to the twelfth rib posteriorly. The pectoralis major and minor muscles are then divided close to their sites of insertion, the individual serrations of the anterior serratus muscle are separated from the ribs, and the latissimus dorsi muscle is incised on its lower lateral edge, corresponding to the lower portion of the skin incision. The next step consists in blunt dissection of the pectoral muscles forward and of the serratus and latissimus muscles toward the back. This having been done, the arm and shoulder girdle are drawn upward and the subclavian muscle is separated

from the first rib so that the rib may be conveniently resected. After the rib resection the continuity of the pectoralis major and minor muscles is carefully restored, the serrations of the serratus muscle are fixed to the periosteum at their original sites by a few fixation sutures, and the latissimus dorsi muscle is again united.

The advantages of this method are that it gives good exposure and an easy approach to the first rib, and causes relatively little hæmorrhage because the formation of large wound surfaces in the muscles is avoided. ZILLMER (Z).

PHARYNX AND ŒSOPHAGUS

Mills, R. W., and Kimbrough, J. B.: Further Observations on the Radium Treatment of Cancer of the Œsophagus, with a Review of Forty-Four Cases So Treated. *Am. J. Roentgenol.*, 1923, x, 148.

In a previous article the authors reported the results obtained with radium in the treatment of eleven cases of cancer of the œsophagus. Since then they have treated thirty-three additional cases, and although their present attitude is essentially the same, the additional experience has suggested certain modifications of technique.

Cancer of the œsophagus, aside from its unfortunate position with regard to successful surgical attack, is one of the most favorable of the internal carcinomata for treatment in that its symptoms are made manifest at a comparatively early stage by the resulting obstruction, the type of cancer is usually epithelioid and therefore amenable to radiation therapy, the neoplasm is a naturally restricted tumor which will act as its own protective barrier, and metastases occur probably later than in any other internal cancer.

Certain principles must be borne in mind in the treatment, viz.: the exact location and physical peculiarities of the tumor must be known, a dose as large as can be tolerated with reasonable safety by normal tissue must be given, and there must be intimate contact of the radium with the tumor and mechanical means of emplacing it, maintaining it in position, and permitting its ready withdrawal by an unskilled person in case of emergency.

Roentgenoscopy and, in less measure, roentgenography constitute a unique means of aiding in the emplacement of the radium within the cancerous stricture and of observing the permanency of such emplacement to a degree not equaled by œsophagoscopy or the old blind method. The radium in a capsule of ordinary type with suitable filters of brass, German silver, and rubber, is mounted on a rubber-covered wire which is introduced after the manner of an ordinary œsophageal sound. After the terminal is favorably emplaced within the stricture the applicator is fixed by a head bandage and left in position for a period of hours.

It seems probable that the radium treatment of cancer of the œsophagus is destined to be supplemented, though not replaced, by modern massive high-voltage roentgen-ray therapy. During the past few weeks all cases under observation have been treated by the latter method in addition to the use of radium.

The diagnosis was established by clinical methods and the roentgen ray, supplemented in a few cases by œsophagoscopy.

The question of technique with regard to the applicator used, the method of emplacement, and the dosage is discussed in detail. In the effort to keep the dosage well within the bounds of safety, the earlier cases were given amounts inadequate to the demands of the condition. Consequently the dosage has been increased from 50 mgm. of radium element left in position for six hours to the same dose repeated every third day for three times, totaling 900 mgm.-hrs. These three successive applications are considered as amounting to a single dose as they occur well within the period of cellular reactive change. As the results have been strikingly better since the use of this larger dose, and especially as no untoward results have occurred, a still larger dosage may be attempted in the future, viz., 1,200 mgm.-hrs. In extensive tumors it may be advantageous to use larger amounts of radium as it is doubtful whether the smaller dose effectively irradiates the entire lesion.

The original plan was to treat initially with the dose mentioned, 300 mgm.-hrs., and repeat it on the recurrence of unfavorable symptoms, if necessary a number of times. In the belief that if the diagnosis is made early there is a possibility of obtaining a radical cure of the disease or preventing secondary sclerosis with late contractural stenosis, the treatment now given is as massive as safety will permit. As far as the heavier dosage has been used it has been found distinctly more palliative than the smaller dose.

Of the forty-four patients treated, the majority had progressed beyond the early stage when first seen. In none of them was a cure effected although one lived three and one-half years and his death was not due directly to the lesion. The duration of life was undoubtedly extended in most cases. The palliative result was strikingly good in twelve, good in an additional twelve, fairly good in fourteen, fair in three, and negative in three. Thirty-four of the patients are dead and ten are still living and under observation. The length of life after treatment varied exceedingly, in general in proportion to the stage and severity of the disease.

Included in the article is a statistical table showing the incidence, location, and condition of the lesions when first seen. Another table shows the relation of the results of treatment to the length of time the disease was present before treatment.

In conclusion the authors state that radium treatment may be considered a successful palliative procedure in carcinoma of the œsophagus as it unquestionably prolongs life and lessens the agony of starvation and thirst. ADOLPH HARTUNG, M.D.

MISCELLANEOUS

Balderry, F. C.: An Experimental Study of the Cause and Effects of Immobility of the Diaphragm. *N. York M. J. & Med. Rec.*, 1923, CXVII, 202.

The author produced immobility of the diaphragm experimentally by three methods: (1) by causing simple pleurisy with effusion by means of an irritant, (2) by causing pleurisy with effusion by means of tubercle bacilli alone or with staphylococci, and (3) by freezing the phrenic nerve with ethyl chloride.

In the production of a simple pleurisy with effusion twenty rabbits were given an intrapleural injection of 5 c.cm. of a 20 per cent aqueous solution of peptone. This produced a rapid exudation of serum into the pleural cavity, usually of such an amount as to cause great dyspnœa and embarrassment of the heart action and necessitating aspiration in from eighteen to twenty-four hours. Fluoroscopic examination of these animals during the exudation revealed the effusion upon the affected side. The diaphragm was in a low position, motionless, and flattened, its normal convexity being entirely destroyed.

Inversion of the animal with resultant gravitation of fluid away from the diaphragm caused the diaphragm to assume its convex form and re-established its motion. Following two or three aspirations the exudation ceased, and from the tenth to the twentieth day examination showed no or little fluid though the diaphragm remained immobile and in a low position.

At postmortem examination the chest was found retracted. The lung was adherent throughout its lower half where adhesions were numerous and heavy. The diaphragm was lower than normal, appearing as a straight line from the midline of the chest to the thoracic wall. Electrical stimulation of the phrenic nerve caused contraction of the diaphragm. On section, atrophy of the diaphragm muscle was found. There was wasting of the fibers with collapse of the sheath and increased fibrous tissue. The diaphragm was therefore immobile because of: (1) increased intrathoracic pressure and fluid, and (2) disease of the diaphragmatic muscle itself, and (3) the presence of adhesions.

In the second series of experiments 2 c.cm. of distilled water containing virulent tubercle bacilli were injected into the pleural cavity. From the eighth to the tenth day fluoroscopic examination showed a slight haziness on the side injected, but the diaphragm was functioning. The haziness gradually increased. About the twenty-fourth day a slight effusion was observed. This accumulated slowly, varied greatly in amount but in no case was more than 22 c.cm., and was usually bloody. Following the appearance of the fluid the diaphragm was motionless in practically every case, but it again functioned upon aspiration of the fluid. In two cases there was immobility of the diaphragm in the absence of fluid. The postmortem findings were very similar to those in the first series, the adhesions being present about the lower half of the lung and the muscle fibers of the diaphragm showing definite degenerative changes.

In the third series of experiments the phrenic nerve was exposed in the neck and ethyl chloride was applied for a period of a minute and a half. Immediately after the operation the motion of the diaphragm decreased and at the end of ten hours was entirely absent. In this condition the diaphragm was in a high position of paralysis and showed a greater convexity than normal. Readings of a water manometer after freezing of the phrenic nerve showed an increased positive pressure in the chest cavity. The immobility of the diaphragm persisted for from five to seven weeks. Section of the diaphragm showed atrophy of the muscle fibers.

In the author's opinion immobility of the diaphragm is produced, not by a single factor, but by the mechanical pressure of the effusion, the presence of adhesions, and the disease of the diaphragm itself, as shown by the histologic changes, acting together.

RALPH B. BETTMAN, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Wolff, G.: The Pathogenesis of Torsion of the Omentum (Beitrag zur Pathogenese der Netztorsion). *Beitr. z. Klin. Chir.*, 1922, CXXVII, 198.

As 109 cases of torsion of the omentum have been reported, a typical picture of this condition has become identified. Torsions of the omentum are divided into torsions with irreducible hernia, those that are associated with an empty hernial sac, and those which occur without hernia. The condition is associated in some way with hernia in 90 per cent of the cases. In cases of herniæ which have been present for years and suddenly become irreducible, showing all the signs of peritoneal irritation, the diagnosis of torsion of the omentum is made easily. When the hernial sac is empty the diagnosis is difficult.

The author reports the case of a man 46 years old who had had an inguinal hernia for many years. On the day of his admission to the hospital the hernia broke through. Attempts at reduction for five hours on the part of the physician were without success. There was no visible peristalsis, but a large hernial mass extended into the scrotum. At operation, which was done at once, the hernial contents were found to be bluish-red omentum which, twisted like an umbilical cord, passed upward into the abdominal cavity in a band as thick as the little finger. This band was resected. During the after-treatment pulmonary embolism developed, but otherwise recovery

was uneventful. The tip of the omentum was twisted 360 degrees seven times.

Twisting of the omentum without any hernial sac is rare. According to Payr, the cases may be divided into the simple and the complicated. The latter are those in which the omentum is adherent to other abdominal viscera. A case belonging to the second group is reported as follows:

The patient was a woman 22 years old who had had attacks of pain in the region of the stomach for four years. During the last three months they had become more frequent. There was no reason to suspect gall-stones. At operation a gall-bladder filled with numerous small stones and without adhesions and a section of omentum drawn into a tip, the only part of the omentum left hanging from the transverse colon, were found. The tag of omentum was resected because of the twisting of its pedicle; it was turned 270 degrees on a pedicle 1 cm. broad.

In this case the torsion was entirely intra-abdominal. Although there was an inguinal hernia on the right side, the latter had absolutely no relationship to the omental tag. A lumpy, thickened omental tag with a thin pedicle is predisposed to such torsion. It is of little importance whether the lumpy change originated within a hernial sac or owes its origin to inflammatory processes. Only the venous stasis caused by the torsion brings the disease picture of the torsion to an acute stage. In the second case reported in this article the attacks of pain were due probably, not to the torsion, but to the traction exerted by the adherent omentum. There is therefore a clinical latent period, a fact which agrees with the findings in animal experiments made by Payr and Litthauer. In cases of hernia, the clumpy change of the omentum in the sac is the prerequisite for the development of omental torsion. If a hernial protrusion results from the abdominal pressure, the omentum may pass through the inguinal canal as the result of twisting motions. SCHUBERT (Z).

Bacon, D. K.: Essentials in the Treatment of Peritonitis. *Minnesota Med.*, 1923, vi, 104.

In any consideration of peritonitis the most important single item is the question of drainage. The various mesenteries form membranous dividing walls separating the abdominal cavity into several definite regions which form natural paths for the extension of inflammation. The mesenteries themselves are both guides and barriers. When the peritoneum attempts to wall off an infection it is best to withhold food in order to decrease peristalsis. The administration of cathartics and pituitrin is also to be avoided, but enemas, if judiciously used, may be given after the first twenty-four hours.

Morphine is of great value as an intestinal sedative and for the relief of pain. Abdominal applications, either hot or cold, have an analgesic effect and produce vascular dilatation. Custom dictates that the patient be placed in Fowler's position. An important part of the treatment of peritonitis is the daily administration of 6,000 c.cm. or more of fluid. This is best given through the skin. Water given by mouth may cause undue peristalsis.

In neglected cases of peritonitis in which ileus is already present the outlook is unfavorable even when operation is performed. Frequent aspiration of the stomach may be of some value. Enterostomy is the only operation possible. H. W. FINK, M.D.

Jungeblut, C. W.: The Bactericidal and the Inhibitory Power of Ether: A Contribution to the Study of the Ether Treatment of Peritonitis (Ueber die bakterizide und bakteriostatische Kraft des Aethers. Ein Beitrag zur Frage der Aetherbehandlung der Peritonitis). *Zentralbl. f. Bakteriol.*, 1922, lxxxvii, 562.

To determine the value of ether treatment in peritonitis the author made bacteriological tests *in vitro*. He found that a concentration of 1:10 in a fluid medium (bouillon culture) did not kill the investigated bacteria (pneumococci, bacillus coli, streptococci, and staphylococci aureus and albus), even when they were exposed to it for hours. The bactericidal power increased with an increase in the temperature. Ether vapor was more quickly effective than ether-bouillon mixture. The author could not substantiate Sigwart's results. The addition of 1 c.cm. of ether to solid media killed pneumococci and bacillus coli and weakened the streptococci, but had no effect on staphylococci.

However, while the bactericidal effect of ether was found to be slight, the tests on fluid and solid media showed a marked inhibitory effect. Therefore the author considers the introduction of ether into the abdominal cavity of value in threatened or beginning peritonitis. THOMSEN (Z).

Jopson, J. H., and Pfeiffer, D. B.: Ochsner Treatment in Peritonitis. *Ann. Surg.*, 1923, lxxvii, 194.

Reference is made in this article to the varying changes in attitude of leaders in surgery toward the treatment of appendicitis and peritonitis by the Ochsner method. This method seems to be less generally accepted today than in 1916. The authors, however, have had a favorable experience with it in certain cases of diffuse peritonitis.

Statistics show a general lowering of the mortality of acute appendicitis in the past few years. In America it is generally agreed that intervention is indicated in the early hours of an acute attack, but in some European countries, notably in France, surgeons are divided on this subject into the interventionists, the abstentionists, and the opportunists. The interventionist favors immediate operation regardless of the stage of the disease or the general or local condition. The abstentionist will not operate in the acute stage unless, after a period of observation, it is evident that the condition has failed to improve, or has become worse. The opportunist believes in immediate operation if the attack has lasted no more than thirty-six or forty-eight hours, but after that prefers to wait for improvement before risking operation.

A study of the attitude of surgeons in general toward acute and established peritonitis indicates that they may be classified into three groups: first, those advocating a waiting policy in all cases of peritoneal infection after the first two days; second, those favoring operation when the symptoms, local and general, are unfavorable or grave, and third, a large group who advise against delay under any circumstances except those in which life is greatly endangered.

While adhering to the general principles of the Ochsner treatment, the authors emphasize that it has certain limitations. First, it is difficult, and sometimes unsafe in young children because of early acidosis from the starvation and sepsis, the lower vital resistance of the peritoneum at this age, and the greater danger in children of metastatic infections in remote regions. Second, immediate intervention is indicated when there is doubt as to the origin of the peritonitis, particularly when there is a possibility of the presence of perforative lesions of the gastro-intestinal tract. Third, immediate operation is necessary when a formerly localized abscess ruptures, as second localization rarely takes place. Three cases are cited to illustrate the septic character of the type last mentioned.

In cases of rupture of a large appendix distended with pus or a basal perforation of a patulous appendix permitting leakage of fæcal matter into an unprotected peritoneal cavity, operation may be delayed beyond the forty-eight hour time limit set for immediate intervention, but assuredly no longer.

It is generally agreed that the management of the disease is properly placed in the hands of the surgeon. Sweeping statements regarding general methods are well for the student mind, but the judgment of the individual surgeon, ripened by experience, shades the rigid application of these principles.

It is argued that early appendicular peritonitis should be operated upon without delay, trusting that the peritoneum will take care of the infection already liberated. It is argued that in this same type of case, rigidly subjected to anatomical and physiological rest, localization will occur and permit operation with relatively little risk. Reported results, however, do not show a great difference in the mortality of cases treated by the two methods.

The mortality is highest in cases which, when first seen, present symptoms of profound systemic toxæmia, usually in the third day of the disease or later. Pre-operative rest is favored in this type of case as the best method of lowering the mortality.

Certain cases show no tendency toward localization and are lost by a waiting policy, viz.: (1) those of young children, (2) cases of delayed and fulminating gangrene or perforation, and (3) cases of intra-abdominal rupture of a localizing or localized abscess.

A summary of the opinions expressed in the literature of the past five years is an interesting review of the diversified views held on this subject by leading men.

V. E. Dudman, M.D.

GASTRO-INTESTINAL TRACT

Rudolf, A.: Experiences in the Surgical Treatment of Gastroptosis (Erfahrungen ueber die chirurgische Behandlung der Gastroptose) *Beitr. z. klin. Chir.*, 1922, cxxvii, 223.

The author recommends gastropexy on the basis of his experience in sixty-six cases (61.67 per cent cured, 26.27 per cent benefited, and 11.66 per cent not benefited). Of these, thirty-three were operated on by the Rovsing technique (53.2 per cent cured, 31.2 per cent benefited, and 50.6 per cent not benefited). In thirty-three cases the ligamentum teres was utilized according to the Perthes-Vogel method as modified by the author (71.5 per cent cured, 21.4 per cent benefited, and 7.1 per cent not benefited).

In Rudolf's modification the ligamentum teres is fixed to the anterior wall of the stomach with a few interrupted sutures 1 to 1.5 cm. distant from the lesser curvature and covered by a continuous row of sutures. The free end of the ligament is then drawn through a small opening made with a scalpel in a cartilage of the left costal arch. The insertion of the ligamentum teres in the liver is fixed in a similar manner to the right costal arch, but in this case two sutures applied very close to each other are sufficient. In certain cases with particularly ptotic lobes of the liver resection of the lobes is undertaken. The best results were obtained by gastropexy in scoliosis.

Von Radwitz (Z).

Moynihan, B.: Some Problems of Gastric and Duodenal Ulcer. *Brit. M. J.*, 1923, i, 221.

Moynihan reviews his experience of the past ten years in the surgical treatment of gastric and duodenal ulcer. He defines a chronic ulcer as a visible and palpable lesion which has been present for months or years. The outstanding symptom is periodic and chronic epigastric pain. In a total of 718 cases there were 531 cases of duodenal ulcer (433 men, 98 women) and 164 cases of gastric ulcer (83 men, 81 women). Twenty-three patients had both gastric and duodenal ulcers.

Since 1912 Moynihan has operated upon more than 500 consecutive cases of duodenal ulcer without a death. In every case the ulcer has been seen and demonstrated. The mortality in cases of gastric ulcer or gastric and duodenal ulcer treated by gastrectomy was 1.6 per cent. Only six of the cases of duodenal ulcers treated surgically were complicated by jejunal ulcer.

The diagnosis of duodenal ulcer can usually be made from a carefully taken history. Surgeons have proved the great preponderance of duodenal over gastric ulcer. The diagnosis of gastric ulcer, on the other hand, is more difficult. In these cases a competent radiologist can be of great aid. The niche and notch in gastric ulcer and the deformity of the bulb in duodenal ulcer afford evidence of great value from a diagnostic standpoint.

The average duration of symptoms was seven and one-half years in cases of duodenal ulcer (excluding

cases with perforation) and nine and one-half years in cases of gastric ulcer. Every patient had been treated medically during one or more of his attacks. Medical treatment is of great value in relieving the pain and curtailing the attacks but has invariably failed to give permanent healing of the ulcer.

Patients with irremovable gastric ulcers treated by gastro-enterostomy plus jejunostomy were fed through a tube directly into the jejunum. No food or liquids were given by mouth. The healing of the ulcer as controlled by X-ray screen examination has always been very slow, requiring from six months to more than three and one-half years. The interrelationship of abdominal disease can be properly demonstrated and suitably treated only by surgical intervention as in many cases gross disease in the appendix or gall-bladder antedates the ulcer. Oral sepsis always demands attention in patients presenting an ulcer syndrome. Medical cure seems powerless to prevent the recurrence of symptoms. Grave complications, chiefly hæmorrhage and perforation, are apt to be associated with recurrent attacks.

In the Leeds Infirmary during the years 1910 to 1921 inclusive seventy-five patients with gastric ulcer died from hæmorrhage or perforation with peritonitis. In sixty the ulcer was of the chronic type. During the same period of time there were 129 cases in which death resulted from either hæmorrhage or the perforation of a duodenal ulcer. The full mortality of surgery is known. We are just beginning to appreciate the death rate among patients presenting repeated "medical cures" and dying several years later from grave complications of their latent chronic ulcers.

With regard to the incidence of cancer on an ulcer basis the author states that an average of two-thirds of the patients with gastric cancer gave a history very suggestive of precedent ulcer. Of supposed chronic gastric ulcers 18.5 per cent have proved to be carcinomatous at the edge of the lesion. In one instance the raised, red, thickened edge of the ulcer showed on microscopic examination a columnar carcinoma on one side and an early scirrhous cancer on the opposite margin. According to McCarthy, gastric ulcers with a diameter of 2 cm. or more are practically always malignant. Without doubt, a chronic ulcer undergoing malignancy frequently grows to such a size as to obscure all gross evidence of its previous presence.

Surgical treatment of gastric ulcer has passed through many stages. Gastro-enterostomy has given good results in many cases but for the surgery of today the results are not good enough. Moynihan has discarded the clean excision of the ulcer with the knife because of the large number of recurrent ulcers following it. Balfour's cautery excision he regards as admirable for small ulcers high up on the lesser curvature associated with pylorospasm. Gastrectomy he believes is the operation of choice in the great majority of cases. In his hands it has been both safe and excellent as regards the permanency of cure. No other operation yields such uniformly good results. He uses the "anterior no loop" method. "The jejunum is brought from the flexure across the transverse colon from left to right and applied to the divided stomach so that the proximal part of the jejunum joins the greater curvature."

Moynihan has employed this method in every case since June, 1920. There have been no deaths and only uneventful early and late convalescences. No ulcers have recurred. No dyspepsia symptoms have followed this operation.

This article is a critical and admirable résumé of a master surgeon's work in the field of gastric surgery.

JOHN W. NUZUM, M.D.

Hardt, L. L., and Rivers, A. B.: Toxic Manifestations Following the Alkaline Treatment of Peptic Ulcer. *Arch. Int. Med.*, 1923, xxxi, 171.

Sippy attributes the chronicity of ulcer to the corrosive action of gastric juice, and on this basis administers small amounts of alkali hourly over a long period (three to four weeks in the hospital and several weeks afterward). He says, "It may be helpful to know that in rare instances it has required the equivalent of 30 gr. (2 gm.) each of calcium carbonate and sodium bicarbonate every hour midway between feedings and every half hour after the last feeding until 9 p.m. to control the free acidity."

With one exception, it has been the experience of the authors that when an attempt is made to control the acidity in a certain group of cases symptoms of toxæmia usually appear. Thus far, however, no one has studied the etiology and symptomatology of the condition from the standpoint of blood chemistry.

From the patients with peptic ulcer who were observed in the Mayo Clinic from April 1, 1921, to April 1, 1922, forty-eight were selected for study and classified in three groups. Group 1 consisted of sixteen patients who were treated for one week by hourly feedings of milk without alkali and then treated according to the usual Sippy method. This experiment was made to determine whether or not the milk alone was a factor in causing the complicating symptoms. Group 2 consisted of sixteen patients who were placed directly on Sippy treatment and remained normal throughout the course. Group 3 consisted of sixteen patients who showed toxic symptoms while under the Sippy treatment.

In practically all cases a twelve-hour specimen of urine (night) was examined microscopically for blood, pus, and casts, and chemically for albumin and sugar. The specific gravity was estimated and the renal function was tested by the phenolsulphonephthalein return. Blood urea, creatinin, and the carbon dioxide combining power of the plasma were also determined. These tests were repeated the day before additional food or alkalis were given and again during the last week of treatment. If symptoms of toxæmia developed, the laboratory data were again obtained. In Group 3 the blood urea was 50 mg. or more for each 100 c.cm. Creatinin determinations were not made unless the blood urea was 70 mg. or

more. In one case the blood chlorides were also determined during the period of toxæmia.

The chemistry of the blood or urine was not affected in the "milk control" patients in Group 1 or Group 2. The sixteen patients of Group 3 exhibited definite symptoms of toxæmia.

Symptoms of intoxication are apt to arise at any time during the course of the treatment, within four or five days after the powders are given, not until the third or fourth week, or following the use of two or three additional 5-gr. calcium-carbonate powders. Patients whose gastric acidity persistently remains uncontrolled may show symptoms early.

Before the patients developed the more serious symptoms they seemed unduly introspective and nervous. They were irritable and complained about trifles which previously they had overlooked. The first symptom was a distaste for milk. In some instances headaches came on almost simultaneously with the dislike for milk, and at this stage it was usually difficult to persuade the patients to take the powders. The headache persisted through the entire syndrome, becoming more severe as the subsequent complaints arose.

With the increasing dislike for milk, nausea became pronounced and the patient vomited on making efforts to take food or water. The vomiting may become alarming and is checked with difficulty, usually only after repeated gastric lavage.

Dizziness is a common symptom even in the milder cases. Aching pain in the muscles and joints was a usual symptom. Respirations became slow, the pulse slightly accelerated, the face flushed, and perspiration profuse. The patient lay in bed limp, apathetic, and very drowsy, and was roused with difficulty. When the symptoms reached the point of nausea and vomiting (with few exceptions), the alkalis were stopped and the patient was put on two-hour feedings consisting of milk, cereals, eggs, fruit juices, and meat broth. In six instances it was necessary to continue this treatment with small doses of alkali because toxic symptoms recurred after attempts to follow the Sippy régime.

During toxic manifestations the blood urea increased from 50 to 296 mg. for each 100 c.cm., and the creatinin from 2 to 5 mg. In the normal patients the carbon dioxide varied from 55 to 70 volumes per cent; in those exhibiting toxic symptoms, from 65 to 117. Albumin and casts were found at some time during the course of treatment in all of the sixteen cases of Group 3. In Groups 1 and 2 the blood was normal.

The gastric acidity was not controlled in any of the cases of Group 3; as a rule it was high. The average total acidity during the period of toxæmia was 78 and the free hydrochloric acid 48.

The toxic manifestations, laboratory data, and pathologic findings in three cases of Group 3 led to the supposition that alkaline treatment may precipitate definite toxic symptoms in patients with renal disease. In these three the blood urea rose to 200 or higher.

Undoubtedly a marked pathologic condition of the kidneys was being dealt with. In all three cases the gastric acidity remained persistently high. The average free hydrochloric acid was 68 and the average total acids were 102. The point is emphasized that alkaline therapy directed toward the complete neutralization of gastric acidity is not only out of the question, but also harmful.

In the other thirteen cases of Group 3 there was no clinical or laboratory evidence of nephritis or nephrosis when treatment was begun, but symptoms of varying degrees of toxæmia associated with renal involvement became manifest within a few days to a few weeks later. It is hardly justifiable to conclude that these patients had definite nephritis at the onset. A more probable assumption is that renal disease with toxic manifestations was the result of the alkaline therapy. It has not been definitely determined which one of the salts or metals is responsible for the toxæmia. However, the diet is not the cause, as none of the patients on the diet alone showed toxic symptoms. The fact that in these cases the acids were persistently high brings up the question of variation in absorption or perhaps depletion of blood chlorides. These patients and patients with gastric tetany had similar blood findings with the exception that in the latter there was a depletion of chlorides in the blood.

The problem as to whether or not true alkalosis is produced by the large amounts of alkalis given is yet to be solved. The hydrogen-ion concentration was not determined in this study, but on the basis of the high carbon-dioxide combining power of the plasma and the administration of large quantities of alkalis, the authors feel justified in applying the term alkalosis.

Guy, E. F.: The Effect of Gastro-Enterostomy on Gastric Function as Interpreted by the Fractional Test Meal. *Brit. J. Surg.*, 1923, x, 403.

The author has modified the Rehfuss technique of obtaining a fractional test meal by giving a pint of oatmeal for the meal and then withdrawing 2 c.cm. every fifteen minutes. To obtain a larger quantity it is often necessary to employ pressure in the syringe which may cause minute hæmorrhage of the gastric mucosa and thus introduce an element of error. Sixteen specimens are removed. Guy emphasizes the importance of filtering the specimen immediately, before marked changes in acidity occur. In the following comparison, *A* represents the titration figures of a specimen filtered immediately, and *B* those of the control specimen filtered after standing in the test tube for four to six hours at room temperature:

		Free HCl	Total Acidity
Example 1	A	7	16
	B	0	11
Example 2	A	15	25
	B	7	17

In thirty-one of more than fifty cases examined the presence of an ulcer was confirmed at operation. In fourteen a duodenal ulcer was found, in nine a pyloric ulcer, and in three a gastric ulcer. The exact position of the ulcer in five is not known.

In fourteen of twenty-six cases which were examined after gastro-enterostomy the acidity curves were obtained both before and after operation.

Gastric ulcer. The length of time during which starch could be recovered indicated that in cases of gastric ulcer the motility was reduced. Bile was present over longer periods than in the normal stomach. In cases of ulcers of the body of the stomach there was hyposecretion of acid.

Duodenal ulcer. In cases of duodenal ulcer the motility was increased even though the fibrosis surrounding the ulcer encroached upon the pyloric ring. The presence of bile was less characteristic in this type. There was marked hypersecretion of acid, and the amount of resting juice was considerably increased.

Pyloric ulcer. In cases of pyloric ulcer the motility was definitely decreased as shown by the fact that starch granules could be recovered as long as three and three-fourths hours after the meal. Absence of bile in the stomach seems to be a marked feature of these cases. There was hypersecretion of acid, but not so marked as in the cases of duodenal ulcer.

In a study of the effects of gastro-enterostomy on the different types of ulcer it was found that a satisfactory gastro-enterostomy always increased the rate of emptying. In five tests carried out on patients subjected to partial gastrectomy, a still more rapid evacuation was noted, the stomach being empty, on an average, within three-fourths of an hour. In two cases in which pain and vomiting recurred after gastro-enterostomy the emptying time was found to be two hours or longer, and in one of these the stoma had ceased to function. After gastro-enterostomy for gastric ulcer there was usually a marked lowering of the acid secretion, while after gastro-enterostomy for duodenal ulcer the decrease in acidity was less marked. The author does not agree with Sherren that duodenal exclusion is the cause of postoperative hyperacidity as he has demonstrated that a high acid level after operation is but the natural result of a pre-operative hypersecretion and is not affected by variations in operative procedure apart from the provision of an adequate stoma.

DENNIS W. CRILE, M.D.

Goldschmidt, W.: The So-Called Linitis Plastica *Zur Frage der sog. Linitis plastica. Arch. f. klin. Chir.*, 1922, cxx, 341.

The clinical and pathologico-anatomical picture of so-called linitis plastica is by no means clear although a great deal has been written regarding the condition. Many authors emphasize the form of the stomach (leather-bottle form, shrinking and thickening), paying little attention to its pathologico-anatomical aspects. It is therefore not surprising that numerous other gastric diseases, such as carcinoma, fibromatosis, syphilis, etc., are often included in the diagnosis of linitis plastica. This fact explains also the various opinions regarding the malignancy of the condition.

The author reports two cases. The second, particularly, showed the picture of linitis plastica macroscopically, whereas an infiltrating carcinoma with colloid cancer cells was found on microscopic examination. In the discussion of the case Goldschmidt raises the question whether this lesion should be described as linitis plastica which it resembled macroscopico-morphologically, or whether it should be designated simply as a colloid cancer, according to the microscopic findings.

VOLLHARDT (Z)

Palugyay, J.: Roentgenological Investigations on the Functional Behavior of the Stomach in the Various Types of Posterior Retrocolic Gastro-Enterostomy, and a Comparison of Its Value in Ulcer of the Stomach and Duodenum (Roentgenologische Untersuchungen des funktionellen Verhaltens des Magens bei den verschiedenen Arten der Gastroenterostomia retrocolica posterior und Vergleich ihrer Wertigkeit beim Ulcus ventriculi und duodeni). *Deutsche Ztschr. f. Chir.*, 1922, clxiii, 197.

Palugyay has investigated roentgenologically the functional behavior of the stomach following the different types of posterior retrocolic gastro-enterostomy on the material of the Hochenegg clinic. On the basis of sixty-one cases he comes to the following conclusions:

In the selection of the type and position of the anastomosis the surgeon must consider whether the stomach is of normal size or dilated, and whether it has a hook or cattle-horn shape. In the dilated stomach, he must consider to what extent the gastric wall will permit regression of the dilatation and whether adhesions are present at the pyloric portion which, when the stomach is reduced in size, may produce a change of form from a hook shape to a cattle-horn shape. The first two points are determined by the X-ray examination and the latter at operation.

With the exception of those cases in which there is an ulcer at the cardiac or middle portion in an hour-glass stomach, in which an anastomosis applied at the upper sac ought to produce favorable results, the following points should be taken into consideration in the performance of gastro-enterostomy:

In the hook stomach of normal size the choice between isoperistaltic and anisoperistaltic anastomosis applied at the caudal pole of the stomach should be governed only by the technical considerations. In cases of dilated hook stomach without pyloric adhesions the oblique isoperistaltic anastomosis comes up for consideration first of all and, secondly, the vertical anisoperistaltic anastomosis. In cattle-horn stomachs and dilated stomachs with pyloric adhesions—which may lead to a cattle-horn form—anastomosis in the pyloric portion is preferable. The vertical isoperistaltic anastomosis

should be avoided in every case. Although the loop may turn and will then give a good result, the difficulties and functional disturbances up to the time of the turning of the loop are not inconsiderable. Furthermore, in some cases turning of the loop does not occur and, as a result, there is permanent kinking. NAEGELI (Z).

Finsterer, H.: Operations on the Stomach (Resections) in Advanced Age (Ueber Magenoperationen—Resektionen—im hohen Alter). *Wien. med. Wochnschr.*, 1922, lxxii, 1641.

On the basis of his own extensive experience Finsterer opposes the opinion held by many that the mortality of operations on the stomach in advanced age is so high that in general it is better not to undertake them.

Carcinoma is the chief disease of the stomach in advanced age for which operation is apt to be indicated. Operations are rarely performed for benign ulcer. A callous lesion which is called ulcer at operation is usually found on later microscopic examination to be cancerous, but there are exceptions to this rule. The author reports three cases of patients over 70 years of age in which the clinical diagnosis was carcinoma, but the histologic examination of the tissue removed at operation revealed a beginning carcinoma on the basis of an old ulcer in only one.

Cases of perforation of ulcer or carcinoma which are rapidly fatal without operation are rare in old age. Finsterer succeeded in saving the life of a woman of 71 years of age by operation performed fifteen hours after the perforation of a duodenal ulcer, in spite of a desperate condition. The pulse, at first very irregular, frequent, and scarcely perceptible, became clearly perceptible after an intravenous solution of adrenalin and common salt.

Finsterer is unable to accept the view of many physicians and internists that the results of extensive operations on the stomach and intestines are worse in advanced age than in youth on account of the danger of pneumonia and heart weakness. In the operations on the stomach performed by Finsterer during the last ten years he has had almost as good results in old persons as in younger persons; pulmonary complications, so much dreaded, were entirely absent.

In carcinoma of the stomach the prospects of a permanent cure by operation are much more favorable in the cases of old persons than in those of young persons since in advanced age the tumor is usually localized, does not spread, and very seldom forms metastases. Of 175 patients subjected to resection of the stomach and sixty subjected to gastro-enterostomy for carcinoma, 33⅓ per cent were between 60 and 76 years of age. Of the patients over 60 years of age who were subjected to resection, twelve (21 per cent) died. The mortality of the 175 resections was only 17.1 per cent. Of the twelve fatal cases, three were cases of extensive resections of the stomach and colon, and in five resection of the pancreas was also necessary. Therefore in all of these cases the prognosis depended less on the age of the patient than on the extent of the operation. In thirty-nine cases in which simple resection was done by Finsterer there were four deaths, a mortality of 10.2 per cent. One of the deaths was that of a woman with very severe anæmia due to bleeding for fifteen months caused by a carcinoma of the stomach. The other three deaths were due to pneumonia. In one of these cases 150 c.cm. of ether were used for ether anæsthesia in addition to local anæsthesia. In the two others the operation was performed under local anæsthesia alone; in one of these, phthisis with large cavities was present, and in the other, the pulmonary inflammation did not appear until the tenth day, when the patient was up and about.

In general, Finsterer found that old, very cachectic persons are often able to withstand well the most severe complications of operation. Of the patients over 60 years of age on whom gastro-enterostomy was performed three died following operation, two from peritonitis and one from pneumonia. Gastro-enterostomy is only a palliative operation, but is definitely indicated when there is marked stenosis, though many surgeons erroneously refuse to perform it on old persons.

Of 369 resections of the stomach for gastric and duodenal ulcer, thirty-four were performed on patients between 60 and 76 years of age, and of 121 gastro-enterostomies with the same indications twelve were performed on patients between 60 and 82 years of age. In the latter twelve cases there was only one death, that of a man aged 82, who was completely comatose twenty-four hours before the operation because of inanition.

In the author's experience, carcinomatous degeneration is exceedingly rare in duodenal ulcer; hence gastro-enterostomy is often all that is necessary. In cases of gastric ulcer, however, resection should always be done, without regard to age, on account of the danger of carcinomatous change. In thirty-four resections for ulcer performed on patients between 60 and 70 years of age there were no deaths although among them were cases with advanced emaciation, severe pulmonary disease, etc. Deaths from peritonitis must be left out of the reckoning when judging of the dangers of the operation in advanced age because this danger is just as great in the cases of young persons. In Finsterer's experience all cases of peritonitis caused by infection from without are fatal.

Finsterer attributes his good results, especially the absence of pulmonary and cardiac complications, to the avoidance of narcosis. Of fifty-five cases of resection for carcinoma, forty-eight were performed under local anæsthesia alone. Splanchnic anæsthesia according to Braun's method is an important advance: 70 c.cm. of a 0.5 per cent solution of novocaine are injected at the twelfth thoracic vertebra when the abdominal cavity is to be opened. With the use of local anæsthesia, operation is possible in many cases with severe bronchitis and

emphysema which forbid the use of ether or chloroform in even the smallest quantities. Therefore neither the family physician nor the internist has any good reason to advise against operation or represent it as particularly dangerous on account of advanced age of the patient. BODE (Z).

Boyd, G. L.: The Etiology of Acute Intestinal Intoxication in Infants. *Arch. Int. Med.*, 1923, xxxi, 297.

The author's summary is as follows:

1. Extracts of intestinal mucous membrane from cases of acute intestinal intoxication in children contain a toxic substance which, when injected into animals, produced a definite syndrome consisting of depression and narcosis, anorexia, circulatory failure, an increase in the number of intestinal evacuations, and in some cases convulsions and death.

2. Younger animals were much more susceptible to this toxic substance than older animals.

3. The toxin is not destroyed by boiling, and passes through a bacteria-tight filter.

4. Crystals resembling those of the dipicrate of β-imino-azolylethylamine were obtained, by appropriate means, from the extracts of intestinal mucous membrane.

5. These crystals proved innocuous to animals until their basic character was restored by prolonged boiling with alcohol, when they became highly potent.

6. Previous dehydration of an animal rendered it more susceptible to the toxin.

7. Boiled aqueous extracts of fresh stools proved non-toxic when injected into animals.

8. Systemic blood from cases of acute intestinal intoxication was slightly toxic when injected into animals.

9. Portal blood from patients was very toxic.

10. No distinctive pathologic findings were seen in any of the fatal cases.

WALTER H. NADLER, M.D.

Gerlach, W.: Mechanical Injuries to the Mucosa Caused by Ascarides in Intestinal Obstruction Due to Ascarids (Ueber mechanische Schleimhautverletzungen durch Ascariden bei Ascaridenileus) *Deutsche Ztschr. f. Chir.*, 1923, clxxiii, 396.

A girl, 9 years old, who was operated on for acute appendicitis (an area of beginning gangrene as large as a pea) showed the signs of ileus and peritonitis four days after the operation. Laparotomy revealed diffuse peritonitis and marked distention of the small intestine which was partly bluish-red. A number of ascarids lay in the small intestine immediately above the ileocæcal valve. Beyond these the ileum was spastically closed. Numerous ascarids were found also throughout the course of the small intestine. About ten worms were removed at the site of the ileus by enterostomy. Death occurred a few hours later.

Autopsy revealed numerous worms in the small intestine. At the points where they were found the mucosa was bright to dark red. In the upper part of the jejunum there were lesions of the mucosa extending into the submucosa. These consisted of longitudinal defects about 3 mm. wide in the inner layers of the intestinal wall which resembled ploughed up furrows. The mucosa at the side of these grooves showed no changes. On microscopic examination, the blood vessels in the reddened areas of the mucosa and submucosa appeared markedly engorged. The mucosa was infiltrated by numerous cells, and the peripheral portions were partly necrotic and partly exfoliated. In the region of the defects the muscularis mucosæ had been completely destroyed and a part of the submucosa showed ulcerative destruction.

Both the injury of the intestine and the spastic ileus were caused by the ascarids. It could not be determined whether there was any relationship between the ascaridiasis and the appendicitis.

GUBAREL (Z).

Quain, E. P.: Pathogenic Ptosis of the Right Colon. *J.-Lancet*, 1923, xliii, 73.

Most of the symptoms induced by coloptosis are due to the dragging on the mesentery or pericolic membranes and the constant fæcal stasis. The symptoms are many and multiform, but may be assembled into three general groups: pain, constipation, and intoxication.

The pain is of two types, that produced in the immediate vicinity of the colon and that produced by the dragging on other organs.

The success of treatment for well-marked coloptosis will be proportionate to the patient's age and intelligence and his co-operation. The younger the patient subjected to colofixation, the more certain and rapid the cure.

Medical treatment should be tried first. This necessitates two or more weeks in bed in a hospital. Several times a day, with intervals of rest, and for an hour after each meal, the patient is placed in the Trendelenburg position on an incline of at least 30 degrees. So far as is possible he is not permitted to raise his shoulders from the bed at any time. An enema is given at least once a day. Meats and albuminous foods are withheld. The diet is made up chiefly of vegetables, carbohydrates, and fruits to retard the putrefactive bacteria and to aid the fermentative flora in the cæcum. Lactose in liberal amounts has also been found of definite value for this purpose.

On leaving the hospital the patient is instructed to lie in the Trendelenburg position for at least twenty minutes after each meal and upon retiring. An abdominal support should be worn and should be placed in position while in the Trendelenburg posture.

The medical régime generally gives only temporary relief, surgery being necessary for a more lasting cure.

When the colonic wall has become infected and thickened, and when pronounced lymphadenitis and

multiple adhesions are present, no operation short of right colectomy will give a cure.

In the presence of cæcum mobile of mild degree, fixation of the caput coli to the root of the meso-appendix should always be done after appendectomy. It is Quain's conviction that this fixation of the cæcum, incidental, accidental, or intentional, has much more to do with the relief of symptoms after operation for so-called "chronic appendicitis" than removal of the appendix itself.

When the cæcum and the ascending colon are both ptosed and hypermobile on a mesentery, a more radical fixation to the psoas muscle is done. An incision is made through the posterior peritoneum opposite the normal location for the cæcum and the cæcum is fixed to the muscle with two or three chromic catgut sutures.

When most of the ascending colon is free and hypermobile, a second peritoneal incision is made somewhat higher, over the edge of the psoas, and two other chromic sutures are introduced. A very solid fixation is obtained by placing the sutures in the posterior longitudinal line of the colon, but this is apt to cause considerable backache in the first few weeks after the operation and may involve a risk of too firm fixation in some cases.

When there is complete right coloptosis, a still higher fixation is made at a point representing the hepatic flexure. It is not possible to effect the fixation to the back muscles because the kidney, with its blood vessels and the ureter, is in the way. The posterior peritoneum is opened and two or three sutures are passed through the areolar tissue in front of the kidney. If there is only a small amount of fat present the muscles near the twelfth rib are easily reached at this point. If there is an abundance of fat it has seemed best not to pass these sutures deeply under the peritoneum, but to be satisfied with a broad peritoneal attachment under the liver.

When the right kidney is definitely ptosed with the colon, the fatty capsule is split over the dorsum and peeled loose from the kidney. The tuft of fat thus freed externally but attached in front of the kidney pelvis is gathered together with two or three chromic catgut sutures and sutured firmly to the quadratus lumborum muscle. This forms a shelf upon which the kidney rests and is a much better procedure than attempts to anchor the kidney itself.

The following is a brief summary of the results following colofixation: Twenty-two (61 per cent) of the thirty-six patients subjected to cæcofixation and colopsoas fixation are free from all previous symptoms, and twelve (75 per cent) of the sixteen with complete colofixation are entirely symptom-free. The majority of the rest, about one-third of the total number, gave constipation as the symptom which had not been entirely overcome by the operation. Four complained of occasional backache, and three had colicky abdominal pains. More or less relief from previous symptoms was acknowledged by all but three. Not the least satisfactory were the results in patients who were relieved of symptoms in other organs—kidney, gall-bladder, and duodenum—and upon whom the most radical and multiple interventions were performed.

The author summarizes his conclusions as follows:

1. Coloptosis is a very common anatomical abnormality.

2. Comparatively few of those who are coloptotic suffer serious symptoms as a consequence, but the incidence of the condition is much greater than was formerly supposed.

3. Some of the effects of coloptosis are attributed to other abdominal organs which may in turn give rise to a new set of symptoms obscuring the original and chief condition.

4. Medical treatment affords relief in most cases and should be given thorough trial in all cases although its ability to cure is doubtful in any case.

5. Surgical treatment is as successful in this condition as in many other so-called surgical diseases, and promises better results as experience accumulates.

6. "Chronic appendicitis" is an infrequent condition. The term should be restricted to those comparatively few cases in which there is actually a chronic lesion of the appendix.

CARL R. STEINER, M.D.

Witherbee, O. O.: The Indications for, and the Results of, Anchoring the Head of the Colon. *California State J. M.*, 1923, xxi, 69.

The author has often noticed that in certain cases of excruciating headache there is an associated lowering and distention of the head of the colon. He therefore endeavored to determine whether this deformity was responsible, in part at least, for the discomfort. Intoxication resulting from colon retention is both local and general. The local effect is exerted upon the nerve endings in the wall of the bowel and interferes with afferent and efferent impulses, thus establishing the vicious circle of lessened mobility, longer retention, greater intoxication, and continued lessened mobility. Of the general effects the most aggravating is the violent headache.

In twenty-eight cases the author separated adhesions and cut all fibrous bands to liberate the colon so that it could lie without restraint and in contact with the parietal peritoneum in the right flank. There he secured it with a running suture uniting the lateral longitudinal band to a fold of the peritoneum for a distance of 5 or 6 in., taking care not to leave any channel between the new line of attachment and the mesocolon through which a hernia might develop. The results seem to be encouraging.

H. W. FINK, M.D.

Einhorn, M.: Chronic Ulcerative Colitis and Its Treatment. *N. York M. J. & Med. Rec.*, 1923, cxvii, 214.

Strauss attributes chronic ulcerative colitis to dysentery, but Yeomans regards it as an infective

condition because of the febrile course, the prostration, and the septic complications.

In reviewing the symptoms, Einhorn describes the characteristic stools, the constitutional reaction, the protracted chronicity, and the resultant disability.

The diagnosis is based upon a stool examination and the subjective symptoms caused by the local condition. If the symptoms are atypical, the proctoscope and the barium enema are valuable aids.

With regard to the treatment, Einhorn outlines a diet containing very little cellulose. He advises abstinence from cold beverages, fruits, and salads, and the use of only small quantities of milk. Care must be taken to provide a diet of sufficient nutritive value.

In the medical treatment of the disorder it is important to use a vehicle which will spread the remedy over long portions of the intestine. Einhorn recommends one to two teaspoonfuls of an astringent in agar, such as tannin agar. Ipecacuanha agar is indicated if the attack follows amœbic dysentery, and lupulin agar if there is colicky pain.

The local treatment consists of retention enemas, irrigation of the colon through the rectum, and irrigation through an appendicostomy or cæcostomy opening. The author avoids the operations mentioned by introducing an intestinal irrigation tube into the cæcum through the mouth. This tube is left in place for two or three weeks, during which time nutrition is also given by mouth.

A case in which this treatment was applied is reported. Six days after the introduction of the tube, the capsule was demonstrated in the cæcum by the X-ray following inflation of the colon with oxygen. One hundred cubic centimeters of a 0.5 per cent mercurochrome solution were then instilled and weak calcium-carbonate solution flushings were given by the dry method. This was continued until the evacuations were free from blood, when the tube was removed.

The procedure is recommended because of its effectiveness and because it renders a surgical operation unnecessary. V. E. Dudman, M.D.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Haas, W.: The Bacterial Content of the Blood of the Portal Vein and the Origin of Liver Abscesses [Ueber den Bakteriengehalt des Pfortaderblutes und die Entstehung von Leberabscessen]. *Deutsche Ztschr. f. Chir.*, 1922, clxviii, 239.

Haas first gives a historical review of the various theories regarding the bacterial content of the blood of the portal vein and comes to the conclusion that permeability of the intestinal wall may be assumed in the presence of severe processes involving the mucosa. He then reports a few very careful investigations on living subjects and a large number of animal experiments. From these he concludes that under normal conditions the blood of the portal vein does not contain bacteria, but that when the mucous membrane of the gastro-intestinal tract is involved by inflammatory or destructive processes, conditions are entirely different. Bacteria can be taken up by the radicals of the portal vein also during any gastric or intestinal operation in which the wall of the viscus is divided throughout its entire extent. The organisms so taken up, however, are always destroyed by the bactericidal power of the blood.

Under certain conditions, bacteria may penetrate into the liver, not only through the branches of the portal vein, but also by way of the blood stream through the hepatic artery—as, for example, in puerperal fever, suppuration of bone, influenza, furuncles, and carbuncles—or, more rarely, by way of the lymph streams.

The biliary passages are the most important carriers of infection. Certain kinds of bacteria acquire a luxurious growth in the gall-bladder and, especially when there is a decrease in the contraction of the biliary passages or a biliary stasis, wander into the liver. They may enter the liver also if the adjacent portions of the stomach and intestine are so injured that their walls become permeable.

Nordmann (Z).

Rehfuss, M. E.: Gall-Bladder Disease. *South. M. J.*, 1923, xvi, 75.

With regard to the etiology of lesions of the gall-bladder the author points out that certain types of bacteria have a special predilection for the liver and biliary tract, and at the same time a certain percentage of these will involve the stomach and duodenum. This might explain the frequent association of the two types of lesion.

Attention is called to the specific elimination by the liver of the colon-typhoid group through the bile passages, indicating that gall-bladder infection may be the result rather than the cause of repeatedly infected bile. Many organisms occurring in the normal bowel have also been isolated from the infected gall-bladder, but the fact that the streptococcus mitis and streptococcus salivarius of the mouth were found twice as frequently as the streptococcus fecalis suggests that diseases of the upper tract are more often the precursors of gall-bladder disease than are lesions of the lower bowel. A common source of infected bile is a diseased liver cell.

Biliary lithiasis is often associated with hypercholesterolæmia. A faulty liver cell may precipitate the cholesterol to form stones. There is a decided increase in the cholesterol in the blood during the early months of pregnancy and in the convalescent stages of typhoid fever and other diseases. Persons with an error in metabolism are apt to have stone formation.

Cases of gall-stone colic are not difficult to diagnose. In the chronic type of case with few or no acute exacerbations a history of changes in the stool and flatulent dyspepsia, especially following the ingestion of fats, the presence of air in the stomach, heartburn, spastic constipation, dilation of the

caecum with spasticity of the descending colon, and tenderness and distress in the gall-bladder region are of diagnostic importance. Important indirect evidence includes fixation of the duodenum, deformities of the duodenal bulb, pressure defects, and fixation of the stomach at the lesser curvature. In many cases there is a definite picture of pylorospasm. An X-ray demonstration of calculus is possible in less than 30 per cent of the cases.

Regarding duodenal intubation the author is of the opinion that it is impossible to obtain a pure sample of bile or to disinfect the upper digestive tract. On the other hand he believes that separate fractions representing the ducts, the liver, and the gall-bladder may be obtained although they are not pure secretions. He states that the evidence of disease in the bile is similar to the information obtained by urinalysis, gastric analysis, or spinal fluid examination. In studying the bile he considers the following factors: (1) a change in its color and consistency, (2) an increase in the cell count, (3) the presence of abnormal elements such as cholesterol crystals, (4) the presence of crystals of amino acids, leucin, and tyrocin, and (5) evidence of profuse epithelial exfoliation and clumping of leucocytes. The serum test for obstructive jaundice is significant.

Infection and stone are both due to conditions outside of the gall-bladder. The resulting phenomena the surgeon may be able to relieve or remove completely. Whether operated upon or not, the case is medical, first, last, and always. A careful search must be made for a primary focus of infection, as most gall-bladder infections are secondary. The intake of cholesterol, fat, and protein in the diet must be regulated.

The intestinal tract must receive attention since toxic elements absorbed into the portal circulation cause liver changes. Transduodenal lavage combined with the Murphy drip relieves biliary stasis.

Cases requiring surgical intervention are those in which there are recurrent acute attacks in spite of medical treatment, those with gross deformities in the right upper quadrant, those with common-duct block, and those of persons of cancer age who do not show improvement under medical care.

WILLIAM J. PICKETT, M.D.

Griffiths, H. E.: The Relation of Disease of the Gall-Bladder to the Secretory Function of the Stomach and Pancreas. *Lancet*, 1923, ccix, 265

It has long been known that there is a close relationship between gall-bladder disease and digestive disturbances. The close proximity of the duodenum, the gall-bladder, the head of the pancreas, and the pylorus makes it difficult in some cases to diagnose disease processes in these different viscera accurately. From an anatomical and physiological standpoint it is important to remember that in from 30 to 50 per cent of normal persons a crescentic band or fold of peritoneum extends from the neck of the gall-bladder downward to the first portion of the duodenum. The presence of such a band does not indicate inflammatory disease of this viscus. The author reports one case in which contraction of the cystoduodenal fold due to cholecystitis lead to complete obstruction of the duodenum.

The vagus is the motor and secretory nerve to the gall-bladder and bile passages, and the sympathetic from the ninth right intercostal segment is the sensory supply to the gall-bladder. The vagus is the motor and secretory nerve to the stomach. The pancreas derives its nerve supply from both the sympathetic and the vagus. Inflammatory irritation of the mucous membrane lining of the gall-bladder results in a reflex irritability of the vagus acting chiefly on the stomach and leading to an increase in both the amount and the acidity of the gastric juice associated with relaxation of the pylorus and regurgitation from the duodenum. If the sensory stimulus is greater, pylorospasm is the result of a sympathetic reflex through the ninth thoracic segment.

Infection of the pancreas is very frequently associated with gall-bladder disease. In the greater number of cases infection occurs through the lymphatics. As a rule the internal secretion of the pancreas is not markedly altered although there may be an increased amount of diastase in the urine.

JOHN W. NUZUM, M.D.

Bolle, H.: A Case of Idiopathic Cyst of the Common Bile Duct (Ein Fall von idiopathischer Choledochuscyste). *Deutsche med. Wchnschr.*, 1922, xlviii, 1581.

In rare cases an obstruction of the common bile duct results from a congenital anomaly of the biliary passages. Usually there is a valve-like obstruction at the point where the common bile duct passes through the duodenal wall. The subsequently developing biliary stasis makes emptying impossible because the duct becomes changed to a large sac.

A case observed by the author was that of a girl, 13 years old, who had never been sick before. The onset of the condition was sudden with cramp-like pains. When the patient was admitted to the hospital her general condition was poor and she showed slight icterus. The right upper quadrant of the abdomen was somewhat distended. At first, slight improvement followed symptomatic treatment, but later there was a relapse with colicky pains, vomiting, and a rise in temperature to 38 degrees C. The stools were absolutely acholic.

The patient was then transferred to the surgical division, an echinococcus cyst of the liver being suspected. Operation revealed a tensely elastic tumor, larger than a man's head, which was partially adherent to the transverse colon and the duodenum and extended above to the under-surface of the liver. It was impossible to find the gall-bladder. The point of origin of the tumor could not be determined definitely because of the patient's poor general condition. The intestine was sutured to the abdominal wall and three liters of biliary fluid were withdrawn. The resulting improvement in the general condition was only transient. As the stools

remained continuously acholic, a second operation was performed. When the edge of the liver was raised the completely atrophic and fragile gall-bladder was torn off. The biliary passages could not be found with certainty, nor could the opening of the sac be discovered. Therefore an anastomosis of the lowest pole of the sac with the duodenum approximately 2 cm. wide was made. An excised piece of the sac wall proved to be the wall of the biliary duct which had been changed by chronic inflammation. Four days after the operation the stools became colored for the first time. Four weeks later the patient was discharged cured.

This was undoubtedly a case of idiopathic cyst of the common bile duct which probably had its origin in a kinking of the common bile duct at its transition into the duodenum. A catarrhal inflammation was doubtless an additional factor in the obstruction, streptococci being found in the punctate of the sac. The diagnosis was made only at the time of the operation, as in the cases previously reported in the literature. Only surgical treatment comes up for consideration. The best procedure is the earliest possible choledochoduodenostomy. SCHUBERT (Z)

Burnham, M. P.: The Importance of Indirect Roentgen Findings in Chronic Infection of the Biliary Ducts and Gall-Bladder. *Am. J. Roentgenol.*, 1923, x, 105

In the early days of roentgenology, the roentgenologist depended for information relative to biliary tract infection chiefly upon the visualization of calculi in the gall-bladder. Subsequently, George showed the possibility and importance of demonstrating the diseased gall-bladder itself, and called attention to other manifestations of infection. During the past few years the author has found the so-called indirect manifestations of duct and gall-bladder inflammation of increasing value in the diagnosis.

These indirect findings are divided into two groups: (1) changes of form and position in the first and second portions of the duodenum, and (2) variations in the normal gastric physiology.

Change of form and position in the first and second portions of the duodenum are due mainly to pressure, but adhesion fixtures as a cause cannot be excluded. These changes consist of clean-cut indentations of the duodenal bulb; crescentic deformities, which are usually seen on the lateral or the inferior aspect of the bulb; irregular deformities of the bulb not of the crescentic type; and distortion in the course of the descending duodenum amounting in many cases to very marked angulation.

The changes noted in the normal gastric physiology are not nearly so decisive as those noted in the duodenum. They may be in the nature of spasm of the antrum with the secondary back-flow of small or large amounts of the meal into the œsophagus due to increased intragastric tension.

The technique employed is discussed briefly. Stress is laid upon the fluoroscopic examination in the right oblique prone position at the angle which will best bring out the different parts of the duodenum. This angle varies in different persons.

In the differential diagnosis the presence of abnormal peritoneal bands has sometimes been confusing, but in general these structures have distinctive features quite different from those of lesions of the biliary system. Several cases of ulcer of the duodenum with old perforation resulting in fixation of the bulb and irregularity of contour not of the type usually due to ulcer have been seen, in which it was impossible to exclude a gall-bladder lesion. Indirect findings have frequently demonstrated the presence of both ulcer and gall-bladder disease.

ADOLPH HARTUNG, M.D.

Abell, I.: Surgical Treatment of Diseases of the Gall-Bladder. *South. M. J.*, 1923, xvi, 84

Neoplasms of the gall-bladder require surgical treatment, but are insidious in onset and frequently not discovered in time for cure. Adenomata of the gall-bladder are found today more often than formerly. These growths result from the irritation of infection or the pressure of stones.

The gall-bladder is infected chiefly through the blood stream and the portal circulation. Infection by the latter route is evidenced by the widespread interlobular hepatitis found in many cases, and infection by the former route is proved by the fact that micro-organisms are often discovered in the walls of the gall-bladder when the gall-bladder contents are sterile.

In the author's opinion, the gall-bladder cannot be dispensed with as readily as the appendix as it has a definite function, though at present this is not thoroughly understood.

Cases of gall-bladder infection may be divided clinically into three groups: (1) those with acute inflammation with or without cystic-duct obstruction, (2) those with a history of colic and a reflex gastric disturbance, (3) cases in which there is no history of colic, but complaint is made of epigastric distress and digestive disturbances.

In the first group the indication for operation is obvious. The others must be cared for according to their particular requirements. Any gall-bladder sufficiently diseased to require operation should be removed as in such case it serves as a focus of infection for the ducts, the pancreas, the myocardium, etc. The dilatation of the common duct following cholecystectomy will insure adequate drainage of bile from the liver. In prolonged cases, disease of the ducts, pancreas, and liver is a complication, and as this overshadows the disease of the gall-bladder, surgical treatment of the latter must be subordinated to treatment of the more grave condition.

In cases of common-duct stone and jaundice it is usually safe to remove the gall-bladder and employ common-duct drainage. When septic cholangitis and liver abscess are present, drainage and care to avoid unnecessary trauma are important. Prolonged jaundice greatly increases the operative risk.

Alkaline water should be given previous to operation and transfusion resorted to as an added protection.

WILLIAM J. PICKETT, M.D.

Friesleben, M.: An Unusual Case of Spontaneous Rupture of the Spleen Cured by Splenectomy (Ein durch Splenektomie geheilter seltener Fall von Spontanruptur der Milz). *Deutsche Ztschr. f. Chir.*, 1922, clxxiii, 45.

The patient was a man 27 years old who was at the front during the entire time of the World War, suffered a slight attack of typhus, and subsequently had a febrile enteritis of six weeks' duration. Previously he had never been sick. Most important of all, he had never complained of pain in the bones. From March 10 to 14, 1919, he had a slight inflammation of the throat, but fully recovered. The rupture of the spleen occurred several days later while he was sitting in his office, and was the cause of a very severe and prolonged hæmorrhage. Splenectomy was followed by complete recovery.

At operation, the liver was found of normal size. An intravenous infusion of camphor and sodium chloride solution after the operation had a striking effect. A pathologic-anatomical diagnosis of leukæmic spleen was made because of the changes in the tissues. The blood smear showed a marked increase in the lymphocytes. The author attributes this to an acute infection or an early hyperplastic process in the tissue controlling the blood. The course of the disease and the subsequent condition of the patient, who was entirely well two and one-half years after the operation, speak against a chronic leukæmia. The author believes the condition was a general infection with a leukæmic blood picture and a corresponding reaction of the hæmatopoietic system. With the exception of the spleen, the lymphatic tissues of the body were not involved. In December, 1920, one and one-half years after the rupture, the patient was subjected to an appendectomy. The blood picture at that time was normal.

COLLEY (Z).

Von Stubenrauch: Surgery of the Spleen: Ligation of the Splenic Artery (Zur Milzchirurgie: Die Ligatur der Arteria lienalis). *Deutsche Ztschr. f. Chir.*, 1922, clxxii, 374.

In the case of a 66-year-old man who, with gout, had hæmorrhages from the skin, the kidneys, and the intestine in November, 1920, the main branch of the splenic artery was ligated 8 cm. from the spleen after the second arrest of the hæmorrhage January 6, 1921. The course of healing was somewhat disturbed by singultus lasting for eight days and by slight suppuration of the abdominal wall.

Previous to the operation the blood picture was as follows: hæmoglobin, 32 per cent, erythrocytes, 3,100,000, leucocytes, 9,000, coagulation time, twenty minutes, no myelocytes, and a few nucleated erythrocytes. Nearly all of the normoblasts were stippled and the blood platelets were unusually few. Twenty-four hours after the operation the number of blood platelets was about normal, and giant blood platelets, a larger number of isolated myelocytes, and isolated stippled erythrocytes were present. Seventeen days later the blood showed a marked poikilocytosis, isolated, pale blood discs, mononuclear leucocytes, and a large number of blood platelets.

Since August, 1921, the patient has again followed his calling as office clerk, has had no more hæmorrhages, and has been free of symptoms. In July, 1921, a marked poikilocytosis, only a few blood platelets, and isolated Jolly bodies were found. On August 18, 1921, more than eight months after the operation, the hæmoglobin amounted to 90 per cent, the viscosity to 4.4, the color index to 0.86, the erythrocytes to 5,200,000, and the leucocytes to 9,551; there were no abnormally altered erythrocytes, few blood platelets, and no Jolly bodies. The blood coagulation time was seven minutes.

On the basis of the case observed and the others reported in the literature, Stubenrauch recommends the ligation of the splenic artery in place of extirpation of the spleen in certain forms of blood diseases. Necrosis of the spleen can be definitely avoided if the ligation is made distant enough from the hilus of the spleen.

CREITE (Z).

Foot, N. C.: Studies on Endothelial Reactions. Changes in the Distribution of Colloidal Carbon Noted in the Lungs of Rabbits Following Splenectomy. *J. Exper. Med.*, 1923, xxxvii, 139.

After splenectomy in rabbits, colloidal carbon introduced into the circulation is removed primarily by the lung, which compensates for the loss of the spleen and contains vastly more carbon than that of a normal rabbit.

The liver, bone marrow, and peripheral lymph nodes show no marked alteration in their phagocytic activity as compared with those of controls. They do not compensate for the loss of the spleen.

The cells phagocytosing colloidal carbon in the lung appear to be produced there, rather than in other organs, as under these conditions proliferation of the endothelium occurs chiefly in the lung.

These cells remain in the pulmonary capillaries and lymphatics or are thrown into the circulation. In the latter case, there is an apparent increase in the number of macrophages in the lumina of the liver sinusoids, but nowhere else, indicating a transference of carbon from the lung to the liver within cells.

It appears probable that these cells are destroyed in the liver and their content of carbon is taken up by the parenchyma, since the latter frequently contains carbon particles and shows mitotic activity.

SAMUEL KAHN, M.D.

MISCELLANEOUS

Silleck, W. M.: Penetrating Wounds of the Abdomen. *Am. J. Surg.*, 1923, xxxvii, 3.

This discussion is confined to abdominal penetrations seen in civilian practice and due to a knife

or bullet. Practically all such wounds are made at close range.

Two types of cases are considered: one in which the abdomen is penetrated directly through the parietes (in these the diagnosis is apparent), and the other in which the penetration is indirect, the condition being only surmised from indefinite abdominal signs until laparotomy is performed.

Significant signs usually present are: hæmatemesis, suggesting a stomach or duodenal injury; melæna, indicating an intestinal lesion; bloody urine indicating vesical or genito-urinary tract involvement; the escape of characteristic fluids from the wound; and the protrusion of omentum or intestine.

Shock and hæmorrhage are practically always present. Persistence of the former usually indicates the latter, which is suggested also by pallor, thirst, a thready pulse, and a clammy skin, and sometimes by shifting areas of dullness in the flanks.

The author classifies these cases into five groups:

1. Perforating wounds without intra-abdominal injury. Wounds of this type are rare. Uneventful recovery follows.

2. Hæmorrhage in the absence of visceral lesions. This is practically always present and is directly dependent upon the severity of the laceration and the parts involved.

3. Perforations of hollow viscera. In general, the intensity of the symptoms and the clearness of the physical findings are almost in direct ratio to: (1) the duration of the condition; (2) the amount and virulence of the liberated intestinal contents; and (3) the amount of bleeding in the abdominal cavity. Persons with such injuries early show signs of shock, abdominal tenderness, and rectus spasm; later, these signs are gradually overshadowed by the increasing manifestations of peritoneal irritation.

4. Injuries to the solid organs. Such injuries not complicated by lacerations elsewhere are very unusual; the mortality depends upon the possibility of controlling the hæmorrhage, which is generally profuse.

5. Massive hæmorrhage. Persons with massive hæmorrhage are practically moribund when they enter the hospital and most of them die within a few hours.

A gunshot or stab wound of the abdominal wall is a sufficient indication for immediate exploratory laparotomy. The incision should be large and so placed that it most effectively brings into view all the supposedly involved viscera.

Solid organs are packed or, when possible (spleen, kidney, ovary, uterus) are removed if the hæmorrhage cannot be controlled; sutures tear through and tend to aggravate the condition.

Perforations of hollow viscera are closed with absorbable sutures. Resection is indicated for: (1) multiple wounds within a space of 12 or 18 in., (2) large tangential wounds, (3) injury of the mesenteric border, (4) gross injury to the blood supply, and (5) cases in which closure would cause a definite obstruction.

A peritoneal cavity free from blood and intestinal contents can be left without a drain, but continued oozing and the obvious presence of intestinal material necessitate very free drainage.

An immunizing dose of tetanus antitoxin is given when the patient enters the hospital. He is then placed in a warm bed. Morphine is withheld until a diagnosis is made. After operation, morphine with atropine is administered generously and retention enemas of glucose and whisky are given. Paralytic ileus should be recognized early and vigorously combated. The diet should be increased as rapidly as possible and the patient gotten out of bed as soon as he is physically able.

The prognosis depends upon the structures involved, the amount of material which has escaped from the hollow viscera, the amount of hæmorrhage, and the time which has elapsed since the injury.

C. Cobbis Yancey, M.D.

Ransohoff, J. L.: The Diagnosis of Obscure Chronic Abdominal Conditions. *Am. J. M. Sc.*, 1923, clxv, 202.

The exploratory laparotomy is falling into the discard; also gastro-enterostomy done in the absence of a demonstrable lesion in the stomach. In the latter case, the true cause of trouble, the gall-bladder or appendix, is often left and continues to cause symptoms suggesting ulcer. Moynihan has designated this condition "appendix dyspepsia." There are no definite attacks of pain, and the pain is less severe than ulcer pain. Instead of food relief there is increased distress after food and after exercise. Vomiting is frequent. Flatulence and heartburn are the most distressing symptoms. In a few cases there is vomiting of blood due probably to minute toxic ulcers or erosions in the stomach. Superficial rigidity of the right rectus muscle without localized pain, or epigastric pain produced by deep pressure over McBurney's point is an important sign.

Reflex symptoms from the appendix or gall-bladder may cause pyloric spasm leading to gastric stasis and hyperacidity, toxæmia, cæcal stasis, irregularities in micturition, or cardiac disturbances. Reflex epigastric pain is common. Removal of a grossly normal appendix often clears up the symptoms.

Mechanical interference such as that caused by adhesions around the gall-bladder may embarrass gastric movements. Pericæcal adhesions may cause intestinal stasis. The correct diagnosis may be established only by the occurrence of definite appendicular symptoms. A single series of X-ray examinations is often misleading. Frequently the appendix is diseased first, this condition being followed by associated disease of the stomach and gall-bladder. The X-ray is of doubtful value except to rule out an actual gastric lesion.

Cholecystitis may be present without pain. In some cases complaint has been made only of a backache between the shoulders.

Epigastric hernia may produce similar symptoms but is very rare. It may cause vomiting or acute pain but rarely chronic invalidism.

Of 150 patients given a routine Wassermann test, twenty-four had a positive reaction, and of the latter, six had undergone abdominal operations without benefit. The condition is often congenital lues.

CAROL E. JAMESON, M.D.

Laewen, A.: Segmental Localization of Pain Through Paravertebral Novocaine Injections as a Differential Diagnostic Method in Intra-Abdominal Disease (Ueber segmentaere Schmerzaufhebung durch paravertebrale Novocaininjektionen zur Differentialdiagnose intraabdominaler Erkrankungen). *Muenchen. med. Wchnschr.*, 1922, lxix, 1423.

In ninety cases of abdominal pain Laewen gave paravertebral injections of novocaine in order to determine the segmental localization of the pain. In gall-stone colic the injection of 10 c.cm. of a 2 per cent solution over the tenth dorsal nerve abolished the pain. The procedure proved valuable in both the diagnosis and the treatment.

It was found that in gastric cases an injection over the seventh dorsal nerve greatly alleviated the pain of pyloric ulcer. Renal colic was influenced by injection over the first and second lumbar nerves. Appendix pains were influenced by injection of the first and second lumbars, but not with certainty and not completely. The muscle spasm disappeared with the pain.

KAPPIS (Z).

Sante, L. R.: Pneumoperitoneum as an Aid in the Diagnosis of Subdiaphragmatic Conditions. *J. Am. M. Ass.*, 1923, lxxx, 464.

Since pneumoperitoneum was first used as an aid in roentgen-ray diagnosis, much has been done to simplify the technique and a great deal of investigation has been carried out to determine the full possibilities of the method. While its application to the diagnosis of subdiaphragmatic conditions is not as wide as for that of conditions in other regions of the abdomen, subdiaphragmatic lesions being limited, the information it gives is often decisive.

Sante reports the case of a young man who was admitted to the hospital with chills, a high temperature, and pain in the back. A perinephritic abscess which was found on physical examination was incised and drained. The temperature then fell to normal. Drainage continued to decrease and at the end of the seventh day had practically ceased. On the seventh day the temperature again rose suddenly and there were chills and profuse perspiration. Both physical and roentgenographic examinations revealed a moderate collection of pleural fluid and immobilization of the diaphragm on the affected side. All of the symptoms suggested involvement of the subdiaphragmatic space. Examination by pneumoperitoneum, however, proved that the subdiaphragmatic space was not involved, and a simple thoracotomy resulted in cure. The information given by pneumoperitoneum therefore guided the surgeon in his choice of operative procedure and led him to perform a much less formidable operation than at first seemed indicated.

Pneumoperitoneum may be of decisive aid also in cases of cardiospasm of the lower end of the œsophagus, adhesions of the viscera to the diaphragm, and hernia of hollow viscera through the diaphragm.

GEORGE E. BEILBY, M.D.

Caucci, A.: Retroperitoneal Cysts (Delle cisti retroperitoneali). *Arch. ital. de chir.*, 1922, vi, 481.

Retroperitoneal cysts develop in the retroperitoneal space or connective tissue of the abdominal cavity. Cysts of partially or completely retroperitoneal organs such as the kidney, suprarenal capsule, and pancreas, are excluded. Sessile or pedunculated cysts may be propagated into the retroperitoneal space from the organs mentioned and others, but the majority occur in the connective tissue or in small structures in the connective tissue, such as the blood vessels, lymphatics, an aberrant portion of the suprarenal capsule or pancreas, or an undescended testis.

Caucci classifies such cysts as follows:

1. Epithelial cysts: (1) ectodermic origin (dermoid); (2) mesodermic origin (Wolffian body); (3) endodermic origin (enterocysts); (4) embryonal (teratoma).

2. Lymphatic cysts: (1) simple (serous and chylous); (2) lymphangiomatous.

3. Pseudocysts: (1) hæmatomatous; (2) serous; (3) urinary; (4) pancreatic; (5) inflammatory; (6) neoplastic.

4. Parasitic cysts.

Echinococcus retroperitoneal cysts are rare and of less importance than congenital cysts. They may be propagated from the pancreas, kidneys, muscles, vertebral column, etc.

The author reports the case of a man 62 years of age who had had enlargement of the abdomen for a long time. There was a distinct tensely fluctuant swelling in the left epigastrium and flank. Bowel inflation, stomach analysis, and X-ray and urine examinations led to a diagnosis of retroperitoneal cyst. At operation the cyst was found lying above and behind the splenic flexure of the colon and forcing the small bowel into the right side of the abdomen. Five liters of turbid fluid containing flocculent material were withdrawn from the cyst. The thick cyst wall was freed from the colon, diaphragm, parietal wall, and kidney. The suprarenal capsule was not seen. The portion of the cyst wall overlying the aorta was left intact and the entire cavity marsupialized to the abdominal opening. The cavity healed in eight months.

KELLOGG SPEED, M.D.

Collins, A. W.: Migratory Tumors of the Abdomen. *N. York M. J. & Med. Rec.*, 1923, cxviii, 65.

References in the standard textbooks and current literature to aberrant or wandering tumors of the

abdomen are few. The earliest case found in the literature was reported in 1860. With one exception, all cases reported were those of women. Campbell and Ower described a tumor removed from a man 69 years of age. This growth had been noticed for twenty-five years and at operation was found to be free from any attachments. Its surface had the glistening appearance of a fibroid, and on cut section the center was found to be calcareous and the surrounding tissue contained no vessels, cells, or nuclei.

The vast majority of the other tumors reported were found in women not operated upon previously. The growths were fibroids or ovarian cysts which had become detached and remained free in the abdominal cavity or had formed new attachments.

In one case reported a fibromyoma of the abdominal wall, evidently due to re-implantation at the time of operation, was found ten years after a hysterectomy for fibromyoma. Two cases of this type of tumor are reported by the author. In the first the tumor was attached to the colon and necessitated resection of a portion of the colon. The microscopic examination showed it to be a leiomyoma similar in structure to a tumor of the uterus removed four years previously. In the second case five encapsulated tumors were removed from the anterior abdominal wall. Microscopic examination showed them to be cystadenomata. A previous operation had been done on this patient for the removal of a papillary cystadenoma of the right ovary.

I. E. Bishkow, M.D.

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Park, E. A.: Certain Factors Causing the Deposition of Lime Salts in Bone. *Dental Cosmos*, 1923, lxv, 176.

Marked and typical rachitic lesions have been produced in rats by the use of diets high in calcium and low in phosphorus. Photomicrographs of bone recovered from rats given treatment after the production of rachitis show almost complete recovery.

The treatment employed in the experiments was the well-established use of cod liver oil and sunlight. It was found that starvation also increased the amount of lime salts deposited in rachitic bones, a fact explained by the assumption that the starving animal draws upon its body tissues for food, thus consuming its carbohydrates, protein, and fat and liberating the amount of phosphorus necessary for normal bone anabolism.

Roentgenograms of two of a set of quadruplet children demonstrated clearly the value of cod liver oil and actinotherapy (the ultraviolet quartz lamp). One of these children, at the age of fourteen months, was given cod liver oil for six weeks before the X-ray pictures were taken, while the other was given none. As a result a striking difference was noted in the bones of the forearms of the two children, the child given cod liver oil having fairly dense bones while its twin showed marked typical rickets. Roentgenograms of the forearm of another baby (aged six months) showed a definite increase in the deposition of lime salts four weeks after treatment with the quartz lamp.

Emphasis is laid upon the advisability of including a considerable amount of green food and milk in the diet of the pregnant woman and of the importance of giving babies cod liver oil and exposing them to direct sunlight and fresh air. Mention is made of the fact that ordinary window glass filters out the radiation of the sunlight which prevents and cures rickets.

Dennis W. Cahill, M.D.

Bloodgood, J. C.: Bone Tumors: Sarcoma, Periosteal Group, Sclerosing Type, Osteogenic, Methods of Diagnosis and Treatment. *J. Radiol.*, 1923, iv, 46.

In cases of bone tumor amputation should be done without delay if a permanent cure may be expected from it.

On the basis of the X-ray picture the author divides bone lesions into two main classes: (1) the central, and (2) the periosteal.

When the evidence is strongly in favor of a malignant process no exploration is necessary if the decision is made to treat the case with radium and the X-ray. If amputation or resection is contemplated, expectant treatment diminishes the possibilities of cure.

The number of cures of periosteal sarcoma after amputation is relatively small.

The author cites a case of sarcoma involving the inner and upper end of the tibia, giving the detailed clinical history, X-ray interpretation, and treatment.

He emphasizes the importance of investigating localized pain in the region of a joint or bone by means of the X-ray. This should include not only the area of pain, but also the corresponding bone or joint. A case of sclerosing osteogenic sarcoma is reported in detail.

The author recommends the examination of specimens removed at exploration by means of Terry's polychrome methylene blue, and urges the perfection of frozen-section study of specimens.

Maurice Bransteen, M.D.

Kaufmann, C.: Sprains of the Large Joints of the Extremities (Die Verstauchung der grossen Extremitatengelenke). *Schweiz. med. Wchnschr.*, 1923, liii, 737, 779.

Wrist. Sprain of the wrist is the most common sprain of the upper extremity and the second most common of all sprains. The author agrees with Bardenheuer that the chief injury is sustained by the joint capsule. This is stretched much more often

than it is torn. In discussing the symptoms the author emphasizes particularly the facts that pressure is only slightly painful or not painful at all, and that closure of the fist is little disturbed when the hand and forearm are placed upon the table. An effusion into the joint is almost always present, but as this occurs also in fractures a fracture must be excluded by roentgen examination. In rupture or separation of the epiphysis, which is much less common, an effusion is not present, the swelling is less, and the pain is rapidly relieved by rest but increased by massage. The possibility of the presence of previous changes in the wrist must be borne in mind, particularly a fracture of the radius (Madelung's deformity) and chronic tuberculosis. The roentgenogram will give information regarding both of these conditions. Acute inflammations more rarely cause diagnostic difficulties.

The prognosis is good; when proper treatment is given ankylosis seldom occurs. The development of tuberculosis does not result from a sprain, but a sprain frequently lights up a previously latent tuberculosis. The treatment consists of massage and the application of a warm, moist dressing until the effusion and the swelling disappear. In cases of old distortions the massage should be begun slowly. Work should be resumed as soon as possible, but delicate work should be prohibited for a longer time. In the author's opinion the application of a plaster cast is not justified, and the effect of the "wrist band" is often over-estimated.

Elbow. Sprains of the elbow are rare. In this condition also, stretching of the joint capsule without complete tearing is the chief injury. The author has never seen ruptures of the joint ligaments and muscles in a case of simple strain. Frequently deformities due to fractures in childhood were present before the accident causing the sprain. Previously present arthritis deformans and tuberculosis may give rise to diagnostic errors. Occasionally arthritis deformans is found in strong laborers of middle age without symptoms.

The prognosis is favorable. Healing requires about three weeks. The treatment consists of rest in bed for several days with the arm on a pillow or in extension, followed by massage. Ambulatory treatment with a triangular arm sling is not advisable.

Radiohumeral and radio-ulnar articulations. Sprains of the radiohumeral and radio-ulnar joints are rare. Usually there is severe pain immediately after the accident, and pronation and supination are painful. The treatment consists in the application of compresses followed later by massage. In the author's opinion the recently described epicondylitis is the result of repeated sprains of these joints, and not rarely an occupational injury.

Shoulder. Sprains of the shoulder joint constitute from one-eighth to one-fifth of the sprains of the upper extremity. The causes are practically the same as those of luxations. Not rarely, changes in the joint caused by acute articular rheumatism and partial ankyloses due to previous injuries or chronic deforming processes were present before the sprain. In all new cases an examination should be made for atrophy of the deltoid muscle, changes in the other shoulder, joint crepitation, and partial ankyloses. Tuberculosis may be fairly latent for a long time and suddenly become acute as the result of a sprain.

With the proper treatment, the prognosis is favorable. Treatment with the triangular arm sling, as generally practiced, and liniments are decidedly contra-indicated. Every patient with a sprain of the shoulder should be kept in bed until active elevation and abduction of the arm to the fullest extent are possible. The upper arm should be raised to the level of the shoulder and placed on pillows in abduction. Massage should be begun on the third day. In cases of old ankyloses and those which have been massaged for a long time, treatment by extension in bed may be successful.

Foot. Sprains of the foot are the most common of all sprains. In the majority of cases the individual ligaments are stretched; complete ruptures are rare. The severe pains are caused by the effusion of blood into the tense ligaments. In general, bone avulsions are unusual in sprains, but a fracture of the external malleolus should be sought for.

In fresh distortions, the best treatment is immediate massage. This generally relieves the pain at once by distributing the effused blood. After the massage a compression bandage should be applied, and over this moist compresses. Bed rest is necessary. The patient may be allowed to leave his bed only when pain is no longer present in the morning. He may return to work in three to five weeks. Cases a few days old and showing marked swelling generally require bed rest with elevation for two days. They should then be treated in the same way as fresh cases.

Knee. Sprains of the knee joint constitute about 16 per cent of all sprains and 28 per cent of the sprains of the lower extremities. Here again a complete avulsion or rupture of the ligaments occurs only in the most severe sprains; usually the injury is a stretching and partial tear. The injury of the meniscus constitutes an injury in itself and as a rule is not associated with a severe sprain. The cause of the sprain is any exaggeration of motion occurring normally in the knee. Any of the ligaments may be affected.

These injuries to the ligaments are frequently visible in the roentgenogram. Injuries of the lateral ligaments can be palpated directly. The diagnosis can be made if fractures can be excluded by the roentgenogram and injuries of the meniscus excluded by the history. Early aspiration is valuable in the diagnosis. An effusion of blood indicates a fresh injury; the admixture of fat droplets, a fracture; and a clear or predominantly serous effusion in the first few hours in addition to other signs such as thickenings of the joint capsule, atrophy of the quadriceps muscle, etc., a previous disease. The history is of little aid as chronic

inflammation of the knee joint often has little effect on the functional capacity.

The prognosis depends first on the proper treatment. In cases of slight genu valgum the course is usually not disturbed, but when there is marked genu valgum it is retarded. Not rarely, a deforming arthritis results after the sprain, but if the joint was previously healthy, this heals after a time; a marked aggravation of a previously present arthritis deformans as a result of sprain is rare. Ambulatory treatment of a fresh sprain of the knee should be discountenanced. The patient should be kept in bed until movement has become approximately normal. The effusion should be aspirated on the inner side of the knee with a cannula 3 mm. thick. The joint should be completely emptied. After the aspiration a warm, moist compress should be applied. If necessary, the aspiration may be repeated. After the cessation of the first pains, careful active exercises and massage should be begun, particular attention being paid to the quadriceps muscle. If the patient is not allowed to get up until the return of approximately normal function he should walk energetically and with a fully extended knee without the aid of crutches.

As a rule, a complete cure results in three to six weeks; if this is not the case, serious lacerations of the ligaments or an arthritis deformans will usually be found. In fresh cases of this kind, motion should not be begun before four weeks, and extensive motions must be avoided. Limitation of motion persisting longer than one year after severe distortions is usually permanent. In chronic hydrops, aspiration should be done and a careful search made for tuberculosis. This should be followed by a few days of rest with the application of compresses and treatment with energetic massage and movement; only in very rare cases was the author compelled to resort to irrigation with carbolic solution. In arthritis deformans, massage is advisable as long as the excursion of the motions improves; this condition often heals after a time if the patient is not too old.

Hip. Distortions of the hip joint are rare. The author has not as yet seen a definite case. In young persons there is usually a tearing of the epiphysis of the head or its complete separation, while in older persons there is arthritis deformans. The treatment consists of rest in bed for three weeks with the leg in extension. DEUS (Z).

Volkmann, J.: So-Called Crepitation of the Scapula (Ueber das sogenannte Scapularknarren) *Klin. Wchnschr.*, 1922, i, 1838.

In the vast majority of cases of crepitation of the scapula the condition is due to overhanging of the tumefied shoulder blade or small exostoses at its upper angle. Induration in the muscles (Jastram) and the appearance of pseudo-bursæ mucosæ (Kuettner) are usually secondary. When the anomalies are slight, as is frequently the case, the development of crepitation is dependent upon the simultaneous presence of other changes such as those resulting from trauma, scoliosis, or tuberculosis (shrinking processes in the pleura and lungs).

In severe cases the treatment should consist in the chiselling or clipping off of any bony prominences through a longitudinal incision at the inner border of the shoulder blade or through a curved incision at the inner upper angle. Muscle plastics (Lotheisen, Mauclaire) may be followed by recurrences. In the cases of patients who dread operation, treatment by bandages may be considered.

Four cases are reported. In the one which was treated successfully by operation two bony elevations were found at the inner upper edge of the shoulder blade, close to its angle. The largest, which was the size of a pea, produced a noise by gliding over the second and third ribs. In the three other cases, in which operation was refused, the condition persisted. STETTINER (Z).

Kappis, M.: Snapping Shoulder and Voluntary Dislocation of the Shoulder (Schnappende Schulter und willkuerliche Schultergelenkverrenkung) *Arch. f. orthop. u. Unfall-Chir.*, 1922, xx, 555.

In the author's opinion most voluntary dislocations of the shoulder are cases of so-called "snapping shoulder," in which there is no dislocation, but the head of the shoulder is drawn with a snapping sound forward or backward under a stretched muscle bundle of the deltoid. This displacement is produced by isolated contraction of the muscles of the upper arm and shoulder blade or of the upper arm and breast.

Kappis collected thirteen cases. The shoulder snapped backward in ten and forward in two. One boy was able to snap his shoulder either forward or backward. In no case was any disease of the shoulder joint found. In many instances laxness of the capsule is assumed, but in the author's opinion this is not necessary for the abnormal movements as the capsule and peri-articular soft parts normally allow sufficient room for play.

As a rule, treatment is unnecessary as this condition usually occurs in young persons in whom it disappears spontaneously in the course of years. True voluntary dislocations undoubtedly occur, but they are rare and indicate the presence of a marked change in the joint. In conclusion the author states that a sort of snapping may be produced by a condition in which the normal movements of the joint are inhibited by an intra-articular or extra-articular cause (catching of the greater tuberosity in a cleft between the short head of the biceps and the coracobrachialis muscle). BANCH (Z).

Satta, F.: Operative Treatment of Supracondylar Fracture of the Humerus in Children (Sul trattamento operativo delle fratture sopracondiloidee dell' omero nell' età infantile) *Chir. d. organi di movimento*, 1922, vi, 685.

The author accepts Kocher's flexion and extension classification of supracondylar fractures of the humerus. He found only one flexion fracture in twenty

two cases of children under 12 years of age. These elbow fractures caused by extension are equivalent to posterior elbow dislocations in the adult. Anatomical reposition is followed by functional recovery.

The classical method of closed reduction is usually successful, but the fact that the forearm can be brought to a right or an acute angle does not necessarily indicate that reduction has been obtained. A controlling skiagram is required. A moulded splint is preferable to a circular cast as the latter endangers circulation.. The period of immobilization should be reduced to from eight to fourteen days, an average of ten days, and should be followed by active and passive motions until a full cure has resulted.

Opponents of this treatment fear new bone formation in the extravasated blood or myositis ossificans. Ambulatory splints and skeletal traction are not well borne by children.

Cubitus varus resulted in 25 per cent of the author's cases, and in more than 5 per cent a late operation was done. In many cases the posterior and medial displacement of the distal fragment cannot be corrected even under anæsthesia, open operation being therefore necessary.

Six cases are reported. In some of them metallic fixation was used. KELLOGG SPEED, M.D.

Ciaccia, S.: A Contribution to the Study of Rigidity of the Hand (Contributo allo studio della rigidita della mano). *Chir. d. organi di movimento*, 1922, vi, 666.

The author enumerates the various traumatic and inflammatory lesions of the hand resulting in rigidity. The success of treatment to overcome the rigidity depends on the cöoperation of the patient. Hand rigidity is caused essentially by limitation of joint movement resulting from alterations in the articular cartilages and the capsular and other ligaments. Such rigidity differs from stiffness due to extra-articular causes in the muscles, tendons, and nerves.

Lesions which cause finger rigidity are direct injuries, such as contusions, sprains, dislocations, and intra-articular fractures, and indirect injuries due to wounds of the soft parts of the hand and forearm, lesions of nearby joints and nerve trunks, prolonged inactivity, and severe and long-standing infections, especially those of a phlegmonous character.

The author reports four groups of cases due to: (1) traumatic injuries with or without infection, (2) phlegmonous infections, (3) fractures of the forearm, and (4) unreduced fracture or cicatricial contracture. KELLOGG SPEED, M.D.

Camurati, M.: Coxa Plana and Tuberculous Osteitis of the Neck of the Femur (Coxa plana ed osteite tubercolare del collo femorale). *Chir. d organi di movimento*, 1922, vi, 685.

The author reports a case of localized tuberculous osteitis of the neck of the femur in a 5-year-old child. The progress of the disease is shown by five skiagrams taken over a two-year period. Although the leg was immobilized, flexion and restricted abduction were obtained. There was shortening of 1 cm. The skiagrams, however, show coxa plana instead of shortening of the neck and a lessened neck angle. In 1909 Waldenstrom reported similar cases in which the healing of localized tuberculous osteitis of the femoral neck appeared as coxa plana.

KELLOGG SPEED, M.D.

Haas: Angiomata of the Capsule of the Knee Joint (Ueber Gefaesstumoren der Kniegelenkkapsel). *Deutsche Ztschr. f. Chir.*, 1922, cxxiii, 130.

The author had occasion to operate on two cases of hæmangioma of the capsule of the knee joint in which the history and findings were in marked variance with each other and for this reason allow far-reaching conclusions regarding the prognosis and treatment of the condition.

The first case was that of a 30-year-old man who, since his fifth year, suffered with painful swelling of the knee joint which, under the diagnosis of tuberculosis, was treated for years by the application of a plaster cast. The patient came under the author's care in his twenty-third year. There was then an effusion into the joint and the knee could not be extended completely. Crepitation in the joint was noted but no palpable tumor. The roentgenogram was negative. There were extensive varices on the leg and in the popliteal space.

Operation revealed large varices in the fascia and the fibrous capsule. The joint was filled with angiomatous masses which covered the synovia everywhere. The cartilage and bones were intact. After the removal of these masses, healing with complete function resulted.

After two years, the same symptoms recurred. At the age of 30 years the patient again requested treatment. Examination revealed moderate effusion in the knee, varicose veins, and muscular atrophy of the leg. The roentgenogram disclosed bone changes.

Operation showed the spread of the recurrence to the joint ends. The joint was again filled with angiomatous masses, the patella was completely denuded of cartilage, and the tumor had ruptured into the bone and the condyles of the femur. After a careful excision of the angioma, during which a cavity was found in the tibia, and after removal of the capsule of the joint with all the recesses, the bony portion of the joint was resected. Good consolidation and cure resulted. The histologic report was capillary and precapillary angioma of the synovial membrane.

The second case was that of a 22-year-old girl who, since the time of her birth, had had several small red tumors below the left knee which gradually grew to the size of a bean. One of these was extirpated five years previously, but a recurrence which caused marked symptoms on walking developed immediately. At the time of the examination by the author a moderately movable, very sensitive tumor,

the size of a walnut, was felt under the cicatrix above the patella on deep palpation, and below it, in an area as large as the palm of the hand, a number of small, bluish, movable tumors. Motion of the joint was very painful. On roentgenoscopic examination nothing pathologic was found.

After the extirpation of the small tumors, the larger tumor was exposed. This fibrous growth, infiltrating the capsule, had proliferated through the fibrous capsule of the joint and invaginated the synovial membrane inward. A portion of the joint capsule measuring 8 by 4 cm. was resected. The rest of the joint was normal.

Healing occurred and there was no recurrence for nine months. The pathologist reported a system of thin-walled, communicating, blood-filled cavities enclosed by firm connective tissue and penetrated by thick-walled blood vessels, i.e., a cavernous angioma.

In both cases the notable feature was the severity of the symptoms. In 1921, the tumor in the first case showed a pronounced destructive tendency by attacking the cartilage and bones, but in 1914 this tendency had not yet developed. In the second case the circumscribed tumor of the capsule was about to rupture into the bones. Both tumors were congenital and, according to Ribbert, should be interpreted as due to disturbances in fetal development.

The diagnosis of the non-palpable tumor is difficult, especially its differentiation from tuberculosis. According to Gangolph and Sabourant, an important diagnostic sign is the difference in the circumference of the hanging and the suspended knee. In the roentgen picture the absence of atrophy of the bone suggests the absence of tuberculosis. In cases of circumscribed tumors the prognosis is favorable as regards function, even though large sections of the capsule must be resected. Laewen covered the defect in such a case by free transplantation of fascia. In cases like the first one described radical relief can be given only by resection of the joint and extirpation of the entire tumor tissue. JANSSEN (Z).

Hellstroem, J.: So-Called Osteochondritis Dissecans of the Knee Joint (Beitrag zur Kenntnis der sog. Osteochondritis dissecans im Kniegelenk). *Acta chirurg. Scand.*, 1922, lv, 190.

Koenig, who established osteochondritis dissecans as a clinical entity, denied its traumatic etiology. A definite solution of the problem of its etiology has not yet been reached. The author reports several cases as follows:

Case 1. The patient was a girl, 18 years old, who fell on her left knee five years previously. This accident caused no swelling and she was not confined to bed; pain was only occasional. Subsequently repeated locking of the joint occurred and crepitation was noted on motion. The roentgenogram revealed a small round splinter of bone at the inner condyle of the femur.

A median arthrotomy was done but no free joint bodies could be found. The anterior portion of the median meniscus was compressed and in shreds, and was therefore extirpated. Histologic examination showed fibrous atrophy. As the symptoms remained unchanged after this operation, another roentgenogram was made. This revealed a broken-off piece of bone. A second operation exposed a piece of cartilage as large as a thumb-nail at the inner condyle of the femur, which was separated from the rest of the cartilage by a slight groove. The "sequestrum" was removed but showed no histologic peculiarities. After the second operation there were no further symptoms.

Case 2. A laborer, 25 years old, complained of locking of the left knee which had occurred for one year. There was no history of trauma. Marked effusion in the knee was found. X-ray examination showed a small piece of bone separating at the inner condyle of the femur. Operation revealed a small cavity in the inner condyle which was filled with a number of pieces of cartilage and bone. The pieces of bone were removed but appeared normal on pathologic examination. A complete cure resulted. At a subsequent X-ray examination an entirely similar condition was seen in the right knee joint.

Case 3. A laborer, 23 years old, had noticed the protrusion of a hard body on the inner side of the right knee joint for eight days. There was no trauma and no locking. The joint mouse was demonstrable only in the roentgenogram. A corresponding defect was apparent on the inner condyle of the femur. The joint mouse was removed by operation.

Case 4. A laborer, 25 years old, fell on his left knee six years previously, but only recently had become unable to extend the knee completely. A distinct focus was found on the outer condyle of the femur. No pathologic lesion was discovered at operation. The findings of a subsequent X-ray examination were the same, but there were no symptoms.

Case 5. A laborer, 19 years old, had had stiffness of the right knee for a year. A scaly roughness on the posterior aspect of the patella was noted on X-ray examination. Operation revealed a small piece of cartilage and bone separating at this point. Histologically, the specimen proved to be bone surrounded by degenerating cartilage.

This disease occurs most often in males in the third decade of life, chiefly laborers. Its most frequent localization is the medial condyle of the femur. No case in which it was localized on the articular surfaces of the tibia has been reported. Occasionally both knee joints are involved. The condition occurs also on the head of the humerus and the head of the second metatarsal bone. An injury is often mentioned in the history, but just as often no trauma is remembered.

The symptoms vary markedly. Occasionally the disease is discovered only accidentally. Pain on extension of the knee is a common symptom. If the joint body has been cast off, the symptoms of a joint mouse are those most prominent. According

to Kirschner, joint locking may occur before the joint mouse is cast off and often is due to injury of the meniscus.

The condition is usually revealed in the roentgenogram and on direct inspection of the opened joint, but in some cases it may be overlooked even when the joint is opened. The roentgenogram is very characteristic. The cast-off piece of bone lying in the depression resembles an egg lying in a bird's nest. After the piece of bone has separated, the depression in the joint contour indicates the original site.

In numerous cases no pathologic-anatomical changes have been found in the joint cartilage; occasionally, a difference in the color of the cartilage is the only sign of the disease focus. Shortly before the separation the surface still adherent to the bone is covered with granulation-like tissue which usually contains the remains of bone. When the separation is complete the joint mouse becomes surrounded by cartilage. In the early stages the cartilage is histologically normal, but later the cartilaginous necrosis constantly increases; the bone is nearly always necrotic. There are no signs of inflammation. It is incorrect to draw far-reaching conclusions regarding the etiology from the histologic examination as the stage of the process in any particular case is not known.

Undoubtedly osteochondritis dissecans plays an important part in the origin of free joint bodies. The author reviews the various theories in detail, particularly those of Barth. In Hellstroem's opinion, it is significant that on extreme flexion of the knee joint the patella meets with the lateral portion of the medial condyle of the femur, just at the site where osteochondritis dissecans generally appears. A blow reaching the patella in this position must be transmitted immediately to the femoral condyle. In contrast to Barth, Kappis assumes that spontaneous healing may occur occasionally. Hellstroem agrees with this view on the basis of his fourth case. The process may be latent for years. Hellstroem attaches no importance in the traumatic etiology to a single severe trauma. Rather is he inclined to regard repeated slight traumata as responsible, since in the beginning there is usually only a partial separation. Slight traumata are often forgotten and therefore are not mentioned in the history. Ludloff's conception is to be rejected as osteochondritis occurs also at sites where no end-artery has been demonstrated. The author warns against applying the findings of Axhausen's experimental investigations too readily to conditions in human joints.

In conclusion Hellstroem states that many cases are overlooked even at operation as the average surgeon does not know the peculiarities of this disease. An important etiological factor, he believes, is an incomplete fracture caused by the pressure of the patella against the condyles of the femur. In some cases this may occur in a condyle of the femur and in others in the patella. As frequently the cartilage shows no fracture, it is to be assumed that, as it is elastic, it can withstand traumata which break the more delicate subcondral bone trabeculæ.

As a rule the treatment must be operative. Free joint bodies must be removed. If no symptoms have developed and if the process is discovered accidentally in a roentgenogram, there need be no hurry, but generally an operation will be necessary ultimately. In cases of beginning arthritis an immediate operation is indicated. It is wrong to wait in every case until a free joint body has formed. With regard to the technique of operation the author recommends the median or lateral parapatellar incision. In order to prevent a recurrence the still-adherent portions of the cartilaginous focus must also be removed. The depression in the articular surface should be smoothed with the curette and freed of granulations. A careful inspection of the articular surfaces is important. Filling of the defect, as with fat, is not necessary. Without operation, the prognosis is unfavorable as a secondary arthritis is usually superimposed. After operation the prognosis is good.

An additional case is reported at the end of the article. The patient was a laborer 37 years old who had a slight effusion in the knee joint. There was no history of trauma. A small joint body was palpable in the lateral articular space, and in the roentgenogram a small splinter of bone was seen at the lateral border of the patella. At operation a small free joint body of cartilaginous substance was found. There was a corresponding slight depression on the outer femoral condyle and a fissure 0.5 cm. long on the posterior aspect of the patella. This portion was lying loose. The histologic examination showed the joint body to be cartilage which had separated into fibers. This case is important because there was a simultaneous injury of the cartilage on the patella and that on the condyle of the femur.

SCHUBERT (Z).

Bircher, E.: A Contribution to the Pathology (Arthritis Deformans) and Diagnosis (Arthro-Endoscopy) of Meniscus Injuries (Beitrag zur Pathologie—Arthritis deformans—und Diagnose der Meniscus-Verletzungen—Arthroendoskopie), *Beitr. z. klin. Chir.*, 1922, cxxvii, 239.

The first 100 patients subjected to cartilage operations at the Canton Hospital of Aarau (cases reported by Baumann) almost without exception resumed their occupations within eight to ten weeks. In one-half of these cases a full restoration of function could be assured two months after the operation. Since the report mentioned, fifty additional cases have been operated on. As Baumann ascribed an unsatisfactory result in a few of his cases to the presence of arthritis deformans, it was important to determine whether or not the cause lay in the operation itself. A careful review, however, showed that the extirpation of the meniscus played a subordinate part as the etiological factor in arthritis deformans.

Bircher undertook to approach the question from a pathological and anatomical aspect. In twenty of fifty cases of meniscus injury he removed a piece of cartilage, 1 to 2 cm. long and 1 cm. wide, from the outer edge of the lateral condyle of the femur. At the same time a careful X-ray examination was made. In nine of these twenty cases the X-ray examination showed definite arthritic changes. In three the findings were questionable. Histologic examination showed arthritis deformans in thirteen; in seven the tissue excised was normal. Of the twelve diagnosed by the X-ray as arthritic, eight were found on histologic examination to be normal, while of the eight shown to be free from arthritis by the X-ray examination, seven showed advanced histologic changes. Therefore, in fourteen cases (70 per cent) the X-ray examination was of no value in the diagnosis with respect to arthritis deformans. Control examinations of postmortem specimens gave similar results.

From these observations it is obvious that we must be very cautious in making a diagnosis of arthritis on the basis of an X-ray examination. Since in many cases avulsion of the meniscus was combined with arthritis, it must be assumed that the arthritis had been present before the injury, and the question whether arthritic changes predispose to meniscus injury must be considered.

To make certain of the diagnosis, which it is generally difficult to do, Baumann made an endoscopic examination of the knee joint. The knee joint was filled with oxygen or nitrogen by means of an apparatus intended for the production of artificial pneumothorax. It was then punctured with a trocar whose cannula was provided with a valve. Through this cannula the laparoscope of Jacobaeus was introduced. Most of the interior of the knee joint could be seen by this method. Twenty cases were examined endoscopically. In eight of nine cases of meniscus injury the diagnosis was confirmed. The endoscopic examination regularly showed a picture differing from the normal.

Arthro-endoscopy renders the joint visible and permits the recognition of degeneration. Its application to the shoulder joint, foot, and hip has been shown by experiments on cadavers to be impossible. Its use must remain confined to the knee joint. Tuberculous affections with destruction of the cartilage and granulation tissue in the joint do not permit examination on account of the diminution in the size of the articular cavity. On the other hand, the method was effective in establishing the integrity of the internal aspect of the joint in a suspected case of incipient tuberculosis. COLMERS (Z).

Camurati, M.: A Rare Case of Hereditary Symmetrical Osteitis of the Lower Limbs (Di un raro caso di osteite simmetrica ereditaria degli arti inferiori). *Chir. d. organi di movimento*, 1922, vi, 662.

The author records skiagrams of a 7-year-old boy and his father who suffered from a condition involving the femora and tibiæ which had a painful onset and resulted in great bony thickness due to symmetrical new bone formation. Similar changes were found also in the bones of other members of the family through four generations. The condition is characterized by localization in the bones of the leg, multiplicity of sites, hereditary character, symmetry, lack of suppuration, and a painful onset.

In the author's opinion the cause is either hereditary syphilis or Paget's disease. Both the son and father mentioned had negative blood Wassermann reactions but the reproduced skiagrams are apparently those of syphilitic bone.

KELLOGG SPEED, M.D.

Weil, S.: Functional Testing of the Lower Extremities with the Aid of Two Spring Balances (Funktionspruefung der unteren Extremitaeten mittels zweier Federwagen). *Zentralbl. f. Chir.*, 1922, xlix, 1406.

The normal person with a symmetrical body structure instinctively assumes such a position in standing that the center of gravity of the body is exactly over the sagittal midline of the supporting surface. If such a person is made to stand with each foot upon a spring balance, both scales will show the same weight.

In every case of organic disease of one leg, the load upon that leg is instinctively diminished, either reflexly because of pain or for static reasons. Therefore by weighing with two scales the extent to which one leg is favored, the importance of certain deformities, the progress of the healing processes after injuries, and the success or failure of certain operations may be judged.

The author cites the findings in pseudarthrosis of the femur, contractures at the hip and knee before and after treatment, coxitis, infantile paralysis, and sciatica. KALB (Z).

Axhausen, G.: The Etiology of Koehler's Disease of the Heads of the Metatarsal Bone (Die Aetiologie der Koehlerschen Erkrankung der Metatarsalkoepfchen). *Beitr. z. klin. Chir.*, 1922, cxxvi, 451.

In two resected specimens histologic examination showed wedge-shaped necrosis of the epiphysis in association with reparative processes. The author is opposed to the theory that the condition is due to trauma. He attributes it to embolic obstruction of the corresponding epiphyseal end-artery by tuberculous fragments or fragments with non-virulent pyogenic cocci. The distal thickening of the shaft he believes is due to simultaneous emboli in the metaphyseal arterial branches causing serous inflammation of the bone. The local processes at the terminal joint in Koehler's disease with secondary arthritis deformans are similar to the formation of free cartilaginous-bony bodies associated with secondary arthritis deformans in the other joints, but in the latter condition the traumatic etiology is evident. GRASHEY (Z).

FRACTURES AND DISLOCATIONS

Lorenz, A.: A New Method of Treating Irreducible Acquired or Congenital Hip Dislocations. *N. York M. J. & Med. Rec.*, 1923, cxvii, 130.

The author recommends his so-called bifurcation operation and reports the results he has obtained with it. He believes this operation is indicated especially for old ununited fractures of the neck of the femur, instability of the hip due to tuberculosis, acute infections, or acute arthritis, old painful congenital dislocation of the hip, and pathologic dislocation following typhoid, osteomyelitis, and other similar conditions. It gives a stable movable hip and is to be preferred to the Gant osteotomy.

PHILIP LEWIS, M.D.

Ashley, A. D.: The Lorenz Bifurcation Operation. *N. York M. J. & Med. Rec.*, 1923, cxvii, 136.

Although congenital dislocation of the hip, ununited fracture of the neck of the femur, and coxa vara luxans have a different etiology, the disturbance of function is similar in all three. In the author's opinion conditions causing similar functional disturbances should have similar or identical treatment.

In the three conditions mentioned the pelvis is no longer propped up by the bony pillars of the femur but is merely suspended at its upper parts by soft and yielding tissue—the capsule and the pelvi-trochanteric muscles. When subjected to undue strain, especially in adults of considerable weight, these soft parts become painful.

The author describes the bifurcation operation, which consists in making an osteotomy below the trochanter and displacing the lower fragment so that it will occupy the position of the normal head, viz., the acetabulum. He emphasizes the point that the osteotomy is a procedure primary to the replacement of the substitute head.

The indications for operation are inability to walk or severe pain. Ashley does not advise an operation for cosmetic reasons but states that the cosmetic results have been very good.

The technique of operation is given briefly as follows:

The patient is placed upon his unaffected side with the affected thigh slightly flexed. A longitudinal incision about 10 cm. long is made through the skin and muscle, exposing the outer surface of the femur. A broad chisel is then applied to the bone so as to make an oblique line of fracture extending from the anterior aspect posteriorly and distally. The upper extremity of this cut corresponds to the upper level of the acetabulum. A complete osteotomy is performed. When the fracture is complete the lower fragment is manipulated as in the reduction of a congenital dislocation of the femur by the closed method. After the fragment has been thoroughly abducted it is forced inward and upward into the acetabulum. No sutures are applied, the fragments being held in position by the abduction of the lower fragment. The limb is then placed in plaster in abduction at 35 degrees.

The patient is allowed out of bed in two weeks and may then begin standing or walking with crutches. After six weeks the plaster cast is cut and knee movements are begun. The cast is removed at the end of three months. The after-treatment consists of massage and active and passive movement of the pelvi-trochanteric muscle.

PHILIP LEWIS, M.D.

Deutschlaender, C.: The Treatment of Old Congenital Hip Dislocations (Die Behandlung der veralteten angeborenen Hueftverrenkungen). *Deutsche med. Wchnschr.*, 1922, xlviii, 1476.

The treatment of old congenital dislocation of the hip is difficult because of the complications which develop not only in the hip joint itself, but also in the back and the loins. Frequently a high-grade lumbar lordosis is present, especially in cases of bilateral luxation. Aside from purely symptomatic and mechanical measures, such as massage, hot air, exercises, and the use of belts, corsets, etc., the treatment consists of non-operative measures to effect reduction, which are applicable to a small group of cases, and operative reduction in a larger group. The author discusses these methods of treatment briefly and then speaks of the radical operation he advanced in 1901, in which the iliopsoas is utilized in a buttonhole mechanism. In thirty cases operated upon by this method there was marked functional and anatomical improvement.

On an anatomical basis, cases must be divided into two groups: those with complete concentric implantation of the tendon and normal motion, and those with eccentric tendon implantation and somewhat limited hip motion. In two-thirds of the cases of children between 8 and 15 years of age a concentric tendon implantation was accomplished. In those more than 15 years old only eccentric implantation could be accomplished. So far there has not been a single fatality.

The radical operation is a serious procedure but its danger should not be overestimated. The best treatment is the bloodless method of Lorenz, carried out at the proper age. LOEFFLER (Z).

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Girdlestone, G. R.: Some Points in Reconstructive Surgery. *Practitioner*, 1922, cix, 456.

Cases of injury due to war wounds or accidents may be divided into: (1) those in which treatment is obviously needed, and (2) those in which careful consideration is necessary to determine what, if any, treatment should be given.

The author cites the case of a man who had good use of a thumb and two fingers of a hand which was partially paralyzed. Although some improvement could be hoped for after operation and treatment

requiring a year's time, it was considered best to do nothing as the man was able to perform his work well in spite of the paralysis.

In determining what to do in a given case the author suggests that the surgeon put to himself the following questions: (1) At what are you aiming? (2) How far will you succeed? (3) Is it worth while?

The result to be achieved is maximum function. Form is of secondary importance.

In judging and treating such patients, surgical knowledge, technique, and ability are necessary, and in addition: (1) a study of the case from all angles, including the patient's occupation; (2) the power to recognize the essential points of disability, which may not be the most obvious; (3) the ability to judge of the probable end-results of the various methods of treatment as regards the patient's ultimate health, activity, freedom from pain, and fitness for work.

The patient is better able to decide with regard to treatments if he realizes the tedium of the various stages and the end-result expected.

MARCUS HOBART, M.D.

Schwarz, E.: The Anatomical Processes in the Regeneration of Tendons and in the Plastic Repair of Tendon Defects by Tendon, Fascia, and Connective Tissue: An Experimental Study (Ueber die anatomischen Vorgaenge bei der Sehnenregeneration und dem plastischen Ersatz von Sehnendefekten durch Sehne, Fascie und Bindegewebe. Eine experimentelle Studie.) *Deutsche Zschr. f. Chir.*, 1922, clxxiii, 301.

The author first gives an interesting historical review of the question of the healing of tendon wounds. As the result of recent investigations, Rehn claims that function is necessary not only to maintain the vitality of the transplanted tendon tissue, but also for the regeneration of the tendon and tendon-like tissue. Bier, on the other hand, assumes that the ultimate cause of regeneration is a chemical stimulation due to hormones which exert their action from the tendon stumps. According to Bier, the tendon tissue has an unusually great capacity for regeneration.

By means of experiments the author attempted to determine whether a tenotomized or a partially or completely extirpated tendon regenerates when the peritenon is intact or when it is completely removed.

Fourteen experiments answered the first question in the following manner:

When the peritenon remains intact a replacement tissue forms in the defect, which functionally takes over the part of the defunct tendon, but in the course of time, in contrast to a normal tendon, becomes stretched, so that the function of the foot gradually becomes poorer. The tendon cells themselves are in no way concerned in the growth of the new tendon; the new formation of the tendon originates in the peritenon. In two to three months the new formation is completed. The new tissue never shows the silvery glisten of a normal tendon. The new tissue is a replacement tissue which is controlled by function. There is no true regeneration.

In the second large series of experiments the peritenon was carefully removed. As a result, a connecting strand was formed which consisted of large vessels, nerves, and vascular connective tissue transformed into tendon-like strands. When function was entirely excluded by division of the nerves, cicatricial connective tissue was formed in the tendon defect by granulations just as in any other wound. A suitable arrangement of fiber-like strands, such as were seen in the former experiments, was not observed. These facts indicate the great importance of function in the formation of tendon replacement tissue. In general we do not know the primary cause of healing in a wound. There is no doubt that chemical changes play an important part but we do not know their nature.

The experiments show also that there is no transformation of connective tissue into true tendon tissue; the newly formed tendon is, and remains, a replacement tendon. The author again emphasizes the fact that it is function alone which can produce a tendon-like tissue from connective tissue which will serve the purpose of a replacement tendon.

The rest of the article treats of transplantation experiments with tendon tissue. It is important that the peritenon be transplanted with the tendon as the new formation of the tissue proceeds from the peritenon after it has become accustomed to its new surroundings. Here again, function plays an important part as it renders the newly formed tissue tendon-like. The transplanted tendon itself undergoes destruction and is replaced by a cicatricial tissue which, in the majority of cases, becomes firmly united with the surroundings and excludes the possibility of function. In contrast to this, the transplantation of fascia by Kirschner's method is to be highly recommended. The transplanted fascial tissue is for the most part maintained and the fascia remains glistening. Very good replacement tendons may be formed from such fascial tissue. The use of other connective tissue for tendon replacement in the form of braided tufts of connective tissue is less advisable.

KOCH (Z).

Iseke, G.: The Plugging of Bone Cavities with Free Transplants of Fat (Zur Ausfüllung von Knochenhöhlen mit freitransplantiertem Fett.) *Deutsche Zschr. f. Chir.*, 1922, clxxiii, 386.

The plugging of bone cavities with free transplants of fat was first attempted by Makkas and Krabbel. The three patients operated on by Makkas were recently examined by the author after ten years. In the first and second cases, which presented closed tuberculous foci in bone, the process healed in a very short time, but complete replacement of the implanted fat tissue by bony substance did not occur. In the third case (chronic osteomyelitis), no traces of a bony defect were demonstrable.

A similar operation was performed in twenty-two cases at the Garré clinic. Krabbel reported ten of

them in 1913. Of the remaining twelve cases, seven were treated more thoroughly. The results varied.

In general, it may be said that replacement of the implanted fat tissue by bone does not occur when the postoperative course is completely reactionless, but that slight inflammation causes complete disappearance of the bone cavity after a time if the plug is intact. The plugging was particularly useful in cases in which a neighboring joint was opened during the operation or it was necessary to remove parts of the joint. HAUMANN (Z).

Lemperg, F.: A Method of Facilitating Plastic Operations on the Deltoid Muscle (Zur Erleichterung der Deltoideusplastik). *Zentralbl. f. Chir.*, 1922, xlix, 1108.

The outer third of the clavicle having been resected, the portion of the trapezius muscle which is here inserted is freed and drawn over the acromion as far as the middle of the deltoid muscle, where it is secured with silk sutures. The periosteal sheath of the clavicle is then joined to the periosteum of the humerus. The mechanical result of the resection of the clavicle to lengthen the lever-arm of the muscle was such as to suggest that in similar cases shortening of the clavicle might be freely carried out on principle, even when there is no limitation of motion in the joint. There is no deformity due to projection of the scapula. In the author's opinion, fascial fixation of the scapula to the opposite side might give still greater strength by drawing on the normal shoulder. VALENTIN (Z).

Schulz, O. E.: New Arthrodesis of the Shoulder (Neue Schulterarthrodese). *Rozhledy v chir. a gynaek.*, 1922, ii, 15.

The author has devised the following method for arthrodesis of the shoulder joint:

The skin incision is made from the middle of the spine of the scapula to the articulation of the acromion process with the clavicle and from here distally to 6 cm. below the acromion process. The capsule of the joint is then opened by a longitudinal incision and the head of the humerus is luxated. The head of the humerus and the glenoid cavity are denuded of their cartilaginous covering and the subacromial bursa is excised. With a rasp, the periosteum is reflected from the upper surface of the acromion process over an area 1½ cm. wide and 5 cm. long, and also to a like extent from the under-surface. Two parallel cuts are made in the head of the humerus, extending from the postero-lateral to the antero-mesial aspect. A twin saw with blades ¾ in. apart is used. The segment of bone limited by these two cuts is cut out with a chisel from its base at a depth of 1½ cm. Into this furrow the stripped acromion is inserted, whereupon the head of the humerus comes to lie in the glenoid cavity.

Immediately after the operation, the scapula, firmly united with the humerus, could be moved up and down.

The advantages of this method are:

1. The freshened surfaces coming into contact are considerably larger than those formed by other methods.

2. The musculature of the shoulder girdle remains entirely uninjured; the trapezius is bound strongly, not only to the acromion process, but also to the humerus.

3. The desired degree of abduction, elevation, and rotation for the arthrodesis can be obtained by varying the length of the incision in the head of the humerus. KINDL (Z).

Wreden, R.: Partial Endoneural Resection in the Treatment of Spastic Contractures of the Hand in Infantile Hemiplegia (Partielle endoneurale Resektionen zur Behandlung spastischer Contracturen der Hand bei infantiler Hemiplegie). *Verhandl. d. Russ. Chir. Pirogoff-Ges.*, Petrograd, 1922.

Acting upon the assumption that spasticity and loss of function of the hand can be traced primarily to preponderance of the motor impulses in the median and ulnar nerves over those in the radial nerve, the author attempted so to reduce the tension of the transverse incision in the former that there would be no destruction of the motor and sensory fibers such as occurs in Stoffel's operation. The median and ulnar nerves were exposed in the middle third of the forearm, the perineurium was divided, and elliptical pieces, 5 to 6 mm. in length and one-half the diameter of the nerve in width, were excised from the nerve trunk. The slit in the perineurium was then closed with fine catgut.

Immediately after the operation the hand assumed a position midway between flexion and extension. In the course of two weeks active flexion again appeared, but during a period of observation of from six to ten months it did not reach its former strength and there was no essential improvement in function. With the exception of less acute perception of pain in the ulnar nerve area and temporary paræsthesia of the palmar surface of the hand on movement, loss of sensation was not noted. Physiotherapeutic massage was begun toward the end of the first month. Up to the present time three children have been operated upon.

The objection made by Girgoloff in the discussion of this paper, that such elliptical excisions cause serious changes, is not of much practical importance as the defect made is small and the intervention too conservative. On the other hand, regeneration takes place slowly enough to permit an increase in function of the opposing muscles.

Rokitski stated that insofar as the motor fibers are sacrificed, Wreden's operation is more radical than Forster's, since the paralytic components are increased.

Grekoff commended Wreden's purpose to strengthen the opposing muscles. By way of precaution he warned of the temporary character of the result and the possibility of neuroma formation.

Hess expressed himself as against Wreden's proposition because the motor fibers are destroyed.

VON DER OSTEN-SACKEN (Z)

Rahm, H.: The Morestin Plastic for Contractures of the Fingers (Die Morestinsche Plastik bei Fingercontracturen). *Beitr. z. klin. Chir.*, 1922, cxxvii, 214.

The procedures devised up to the present time for the treatment of contractures of the fingers are not satisfactory. The tendon transplantation of von Harder is too complicated, the silk tendons of Lange often do not heal in, and disarticulation is a deforming process. Morestin's procedure is as follows:

The very abundant skin present on the flexor surface of the fingers, which may even form a web, is split longitudinally into two layers and transverse incisions are made in both of the folds of the web, alternating right and left, until all tissue hindering the extension of the finger has been divided. If the finger can then be completely extended, the small triangular skin flaps formed are alternately reflected back over the wound surface so that a triple serrated line of incision is formed. The flaps are fixed in position by a few sutures. A dressing is then applied and the finger immobilized for about eight days. At the end of this time hand baths and frequent motions, first passive and then active, are begun. If it is necessary to divide a tendon which has been enmeshed in the cicatricial masses the finger is grasped by a neighboring finger during closure of the fist and carried along into the palm of the hand.

Three cases in which this method was used successfully are reported. LOEFFLER (Z).

Schulz, O. E.: Peri-Articular Fixation of the Knee Joint (Paraartikulare Fixation der Kniegelenke). *Comp. Ref. Zeit.*, 1922, lxi, 926.

To immobilize the knee joint in cases of complete paralysis of the legs, the author proceeds as follows:

A longitudinal incision 16 to 20 cm. in length is made on the inner side of the knee joint. The soft tissues are incised down to the periosteum of the femur and tibia; the fibrous capsule of the knee joint is divided, but the synovial membrane is carefully avoided. The periosteum is incised and a strip 2 cm. wide is elevated. With a chisel, a groove 2 cm. wide and 1 cm. deep is made in the femur and tibia along the entire length of the incision. A graft from the tibia, corresponding in shape, is laid in this groove and the periosteum and fibrous capsule are sutured over it. Another splint from the tibia is placed in the same way on the outside of the knee.

In two cases the technique was more simple in that the middle portion of the fibula was utilized only on the lateral aspect of the knee joint.

In every case firm ankylosis resulted and was still present six months later. This method gives firmer and more lasting results than immobilization by means of tendon fixation. KIDDL (Z).

Epstein, G.: The Question of Operative Procedures for Congenital Deformities of the Feet (Zur Frage blutiger Eingriffe bei kongenitalen Fussdeformitaeten). *Verhandl. d. Russ. Chir. Pirogoff Ges.*, 1922.

For the correction of club-foot Epstein favors atypical wedge excisions. In the discussion of his paper Albrecht stated that those who adhere to bone operations in cases of club-foot underestimate the element of traumatic osteoporosis which makes it possible, when limited partial correction has been achieved in the second stage, to obtain complete correction with the greatest ease two weeks later. Osten-Sacken stated that the indications for the treatment of club-foot formulated by Kocher forty-four years ago are still correct. He laid down the rule that tenotomy of the Achilles tendon should be resorted to only after satisfactory adduction has been obtained and supination still makes it necessary. Pathologico-anatomical studies demonstrate the impossibility of obtaining a quick cure in such a complicated deformity. In the orthopedic clinic of Turner the difficult refractory cases are treated by wedge excision supplemented by corrective orthopedic measures.

VON DER OSTEN SACKEN (Z.

SURGERY OF THE SPINAL COLUMN AND CORD

Hackenbroch, M.: Congenital Curvature of the Spine as an Intra-Uterine Deformity of Weight Bearing (Beitrag zur Kasuistik der angeborenen Rueckgratsverkruemmung als intrauteriner Belastungsdeformitaet). *Arch. f. orthop. u. Unfall-Chir.*, 1922, xx, 500.

Congenital curvatures of the spine are generally divided, according to their etiology, into those of endogenic origin, the result of germinal variations, and those of exogenic origin. The latter are intra-uterine deformities of weight-bearing and must be differentiated from cases in which the deformity was caused by intra-uterine disease. The exogenic scolioses are in the minority. Boehm considers every habitual scoliosis a retarded congenital form.

The author reports three cases of congenital curvature of the spine, two cases of scoliosis, and one case of kyphosis, which were produced entirely exogenically by intra-uterine pressure. There were no abnormal formations in the vertebræ. All of the three cases were further characterized by resistance to treatment with the plaster bed. BAISCH (Z).

Mixter, W. J.: Fracture of the Spine with Cord Involvement. *J. Bone & Joint Surg.*, 1923, xxi, 21.

The indications for operative interference in fracture of the spine cannot be delimited sharply. Laminectomy is indicated in injuries resulting in damage

to the cord either through crushing without complete severence or by intra- or extra-dural hæmorrhage or œdema. Injury of the cauda equina should be treated in the same way as injury to a peripheral nerve, operation being performed if there is a disturbance of function.

Fracture of the bony column without cord involvement should be treated by the application of a bony splint or a plaster jacket or both. If careful mapping of sensory changes within two or three hours shows increasing involvement of sensory function, operation is indicated. As shown by Allen, time is an important factor, and a definite course should be mapped out at least within the first twenty-four hours. It is only in lesions of the cauda equina that late operation for cord damage may be of some value. Allen showed also that when dogs were subjected to identical crushing injuries of the cord those treated by median longitudinal section within a few hours of the injury to combat the œdema recovered function while the others did not.

The laminectomy performed by Mixter is that advocated by Gaenslen. The muscles of the back are dissected away from the spinous processes and laminæ on one side only. The spinous processes are then cut away from the laminæ with heavy forceps, being left attached to the muscles on the untouched side. The laminæ are removed with rongeurs and all bone chips are preserved for future use. The various procedures indicated in a given case, such as the removal of clot or in-driven fragments of bone, are now carried out. The articulations, if not already destroyed, are crushed and bone chips are laid between the stumps of the laminæ on both sides. The muscles are sutured to the interspinous ligament and the fascia and skin are closed.

DAVID R. TELSON, M.D.

Turner, H.: An Unusual Case of Typhoid Spine with Symptoms of Spinal Cord Affection. *Brit. M. J.*, 1923, i, 142.

Involvement of the spine in the typhoid process probably takes place during the flourishing period of the disease, and doubtless is not very rare. The symptoms of this complication may pass unnoticed on the background of the grave picture of the illness.

Typhoid spondylitis is a form of subacute inflammation involving the periosteum, ligaments, and vertebral articulations. Gibney's term, "perispondylitis," is the most suitable to describe the pathologic changes.

Chiefly the posterior lateral parts of the laminæ are involved, their mobility probably influencing the exacerbation of the process.

The picture of typhoid spondylitis as revealed by the X-ray is very characteristic. There is narrowing or partial disappearance of the intervertebral spaces with lateral protrusion of the contiguous edges of the bodies. Dense vertical shadows on one or both sides of the midline reproduce the massive bridges of newly formed bone by which the posterior parts of the column are fused together. Occasionally there is a scoliotic curve due to asymmetrical disposition of the disease.

Clinically, the symptoms of infectious spondylitis differ markedly from those of Pott's disease. Acute excruciating pain in the back is the chief complaint. Digital pressure reveals intense pain in the lateral parts of the spine. The soft tissues of the region involved may be thick and œdematous. An intermittent fever generally accompanies the initial stages of the process.

The involvement of the spine in the typhoid process is a frequent integrant part of the disease, the infection persisting in a latent state. The awakening of the process is generally brought about by trauma. Therein lies the explanation of the development of typhoid spondylitis a long time after recovery from the original disease.

The author reports a case of typhoid spondylitis in which there was suppuration. This is the only positive case known in which suppuration complicated the spinal affection. SAMUEL KAHN, M.D.

Hoffmann, V.: A Propping Operation on the Vertebral Column: Thoughts on the Operative Treatment of Spondylitis (Eine Stuetzpfeileroperation der Wirbelsaeule: Gedanken zur operativen Behandlung der Spondylitis). *Zentralbl. f. Chir.*, 1922, xlix, 1443.

On both sides of the vertebral column a rib with periosteal and vascular flaps is placed in the trough over the joints of the transverse processes of the ribs to form a bony union. In addition, a dorsal prop is raised in such a way that a free rib transplant is laid into the angle between the arch and the spinous process.

The operation is carried out in two stages, one side being operated on at a time. The use of anæsthesia and the local application of adrenalin to prevent hæmorrhage from the musculature and nerves are advisable. The vertebral column does not lose its anatomical support through the removal of the ribs. BODE (Z).

Leri, A.: On Lumbar Arthritis. *Am. J. Clin. Med.*, 1923, xxx, 103.

By lumbar arthritis Leri means the localization of chronic vertebral rheumatism in the lumbar vertebræ. This affection, which was frequent during the war, produces symptoms very different from those hitherto recognized as characteristic of chronic vertebral rheumatism.

The patients are usually between 20 and 40 years of age, and enter the hospital on account of lumbago or sciatica. Usually this condition is unilateral, but it may be bilateral or alternating. Complaint is made of sharp pain, both continuous and paroxysmal, in the lumbosacral region, and often also in the buttocks and thighs. Sometimes the pain is limited to the calves.

The posture is variable. Only rarely does the patient stand erect. As a rule he bends his body forward and holds his knees flexed. He may also

bend either to the right or to the left. Sometimes there is a slight puffiness, without actual œdema, redness, or heat, in the lumbar region. The bony protuberances are merely obliterated. When the patient bends forward there is an accentuation of the line of the lumbar spines and above this a depression. In the normal person there is a continuous arch. This sign is almost pathognomonic. There is little or no contracture of the lumbosacral muscles.

When lying extended on a bed, the patient is able to stretch himself with perfect ease, so that his head, pelvis, and feet touch the plane of the bed.

The roentgenogram shows a sinking, a transparency, and especially an excessive grooving of the vertebral bodies with enlargement of the superior and inferior surfaces (*vertebræ en diabolo*).

Sometimes a tapering of the surfaces and a sort of "parrot beak" is noted which is very characteristic, and sometimes more or less voluminous nodules of neo-ossification, a thickening of the cartilages, and an abnormal undulation of the vertebral borders are found.

Anatomically there is an osteophytic proliferation. Frequently this is crown-shaped.

The malady progresses by repeated attacks, each lasting two to ten months and followed by apparently complete clinical recovery.

The disease is evidently not due to lues, tuberculosis, or gonorrhœa. Rhizomelic spondylosis has no relationship to it whatever.

In Leri's opinion the cause is to be found in the abnormal living conditions to which soldiers are subjected in active warfare. Often they sleep on damp ground or in the water, and in the trenches they rest their backs against freshly turned earth. Frequently the muscles of the back are excessively exerted by long marches and the carrying of heavy packs. Temperature seems to play little if any part.

The disease can be readily distinguished from functional disorders by the definite deformity and by the X-ray findings. A knowledge of the nature of this condition and its mode of evolution is of importance with regard to medico-military decisions.

The treatment is the administration of salicylate of sodium and immobilization. The author shows the postural and bony changes by numerous plates.

CLAYTON F. ANDREWS, M.D.

SURGERY OF THE NERVOUS SYSTEM

Puusepp, L.: Transplantation of Spinal Nerve Roots in Flaccid Paralysis (Ueber Transplantation von Rueckenmarksnervenwurzeln bei schlaffen Lachmungen). *Beitr. arztl.*, 1922, i, 442.

Puusepp undertook to transplant the nerve roots in four cases of infantile paralysis in which many of the muscles, for example of the whole lower extremity, were paralyzed, and in which orthopedic procedures were ineffective. After a laminectomy he cut through the roots of the second, third, and fourth lumbar and the eleventh and twelfth dorsal nerves and sutured the second and third lumbar nerves to the eleventh dorsal and the fourth lumbar to the twelfth dorsal. In two cases movement could be observed along the previously paralyzed lower extremities and the circumference of the extremities was increased. In the cases in which the legs had been paralyzed two years or longer, the results were uncertain. In one case with injury of the cauda equina, Puusepp sutured the central portion of the cauda equina to the twelfth dorsal nerve. After two months, incontinence of urine ceased. Puusepp believes that restoration of function undoubtedly takes place and that technically the operation is entirely practicable.

MICHELSSON (Z.).

Lehman, E. P.: Per-Arterial Sympathectomy. *Ann. Surg.*, 1923, lxxvii, 30.

In the dog, the perivascular sympathectomy of Leriche does not result in the physiological changes in the extremity noted by Leriche in clinical cases.

Vasodilation resulting from proved total sympathectomy does not affect wound healing.

H. A. MCKNIGHT, M.D.

Halstead, A. E., and Christopher, F.: Peri-Arterial Sympathectomy. *J. Am. M. Ass.*, 1923, lxxx, 174.

Division of the cervical sympathetic nerve causes dilation of the blood vessels of the ear on the same side. Stimulation of the peripheral end of this nerve causes vasoconstriction and blanching. The sympathetic nerves pass through the adventitia of arteries to form plexuses in the pars media.

Leriche observed that pinching the external layer of a blood vessel causes the vessel to contract, arrests its pulse, and decreases its size. If the cellular layer is excised, the diminution in size progresses to one-fourth or one-third the normal size. After three to fifteen hours secondary signs appear: (1) elevation of the local temperature from 2 to 3 degrees, giving a subjective sensation of heat; (2) elevation of the arterial pressure possibly as much as 4 cm. of mercury; and (3) an increase in the amplitude of the oscillations. After peri-arterial sympathectomy the vasodilator reaction is transitional, becoming attenuated from the fifth to the sixth day and disappearing after from three to four weeks.

In Leriche's operation the artery is isolated for 8 to 10 cm., the sheath is divided, and, with one part held with the forceps, the tunica adventitia is dissected away with a knife or a cannular sound until the vessel is completely denuded. Leriche has performed the operation fifty-four times on the following indications: causalgia or a similar syndrome, eleven cases; painful stumps, two cases; contractures following trauma, nineteen cases; extensive traumatic œdema, four cases; trophœdema, one case; ischæmic sequelæ, four cases; trophic sloughs on a stump, one case; trophic sloughs after nerve

section, ten cases; a sore on the heel after medullary injury, one case, varicose eczema, one case, trophic disturbance after frostbite, one case; spasmodic paralysis, one case; to modify the pressure of the cerebrospinal fluid, three cases; Jacksonian epilepsy, two cases; goiter, one case; intermittent claudication, one case; and erythromelalgia, one case.

In Leriche's opinion, peri-arterial sympathectomy is often very efficacious in the relief of pain, will influence symptoms of muscular hypertonia, and is beneficial in trophic disturbances leading to ulceration.

The authors report the employment of peri-arterial sympathectomy for endarteritis obliterans associated with pain and numbness of the right foot in a patient aged 55 years. The pain radiated to the calf of the leg and the ankle was weak. The patient was unable to walk more than a half block at a time. For four days and nights the pain became so excruciating that sleep was prevented. The right foot was painful when manipulated, and to a less extent the right calf was painful on palpation. The urine contained a faint trace of albumin and a few hyaline casts. The Wassermann test was negative. The patient was not benefited by treatment with Locke's solution, sodium citrate, potassium iodide, sodium bromide, chloral hydrate, nitroglycerine, thyroid extract, or sodium nitrate.

Peri-arterial sympathectomy was done on the right femoral artery at the juncture of its middle and lower thirds. The adventitia was stripped completely off for a distance of 5 cm. The patient was discharged from the hospital on the thirteenth day after operation. As a result of this treatment he is able to work on his feet for nearly twelve hours a day as cashier in a restaurant, and can walk a mile or more. He has only slight pain when he walks rapidly, and the numbness has practically disappeared. The leg is warm, and tactile and thermal discrimination is normal.

WALTER C. BURKET, M.D.

Callander, C. L.: Arterial Decortication. *Ann Surg.*, 1923, lxxvii, 15.

Leriche has called attention to certain definite results which follow the excision of the sympathetic nerve plexuses which lie in the intimate sheath and adventitia of large blood vessels. These structures were surgically removed from the femoral artery by Jaboulay with successful results in cases of perforating ulcers of the foot, and less successfully from the cœliac trunks in certain visceral disturbances. The technique is as follows:

The main arterial trunk is exposed by the classical route of access a considerable distance proximal to the part affected. The external fibrous sheath covering the artery is then incised for a distance of 8 to 10 cm., and the artery, with its inner and more intimate sheath and its adventitia, is exposed. This inner sheath, which is fused with the adventitia of the artery, is grasped with tissue forceps and incised directly on the vessel wall. Traction is maintained on one of the lips of the sheath of filmy tissue thus isolated, and this structure completely freed from the artery over the length of the incision with a knife or fine scissors. In this manner the artery is stripped of its external coat, together with the fibrous tissue adherent to it.

The immediate consequence of the denudation of the artery is a diminution in its caliber which progresses until the artery assumes the appearance of a small, whitish cord, suggesting a nerve trunk.

Leriche constantly found a postoperative increase in the surface temperature distal to the decortication. He stated that this was noted once on the evening of the operation but more often on the following morning. Usually, however, it occurred thirty-six hours after the operation and marked the onset of vasodilation. In most of the cases reported the local hyperthermia disappeared about the fifteenth day after operation.

Leriche reported also a constant postoperative rise in the systolic pressure distal to the point of operation; this has not been verified by the author.

Leriche has cured traumatic disorders of the Babinski-Froment type in which there are contractures and pareses and the complete picture may present muscular atrophy, exaggeration of the knee-jerks, changes in the cutaneous reflexes, and disturbances in objective and subjective sensibility. Vasomotor, secretory, and trophic disturbances are noted in the bones, skin, hair, and nails.

Another rare but well-recognized clinical picture which has yielded to arterial decortication is the causalgia of Weir Mitchell.

Certain ulcers which occur in amputation stumps over areas not subject to pressure and which are not caused by infection are very refractory. According to Leriche, several ulcers of this type have closed promptly after decortication of the femoral artery and their scars have remained sufficiently resistant to bear the use of apparatus.

The author reports a series of ten arterial decortications which were performed on six patients; in one case three arteries were decorticated for disease of three extremities, while in another the operation was performed on two arteries for disease in two extremities.

Group 1 included patients in whom the arterial changes at the time of operation were thought to be spasmodic rather than obliterative, as evidenced by the presence of palpable peripheral pulsation of the artery. Group 2 included cases in which an obliterative arteritis seemed to be the most important factor, and no arterial pulsation in the affected extremities was noted. Group 3 included one case in which the cause of the pain could not be determined.

In three cases in Group 1 no improvement followed the operation.

In the second group of cases one definite cure was obtained. This patient had an ulcerative gangrene of the dorsal surface of the middle toe of the left foot. Several weeks after the operation the gangrene

disappeared and the sloughing healed into a resisting scar.

In the one case of Group 3 operated upon for unaccounted-for pain in the thumb the pain disappeared. H. A. McKnight, M.D.

Taylor, W. J.: The Surgical Treatment of Chronic Sciatica. *N. York M. J. & Med. Rec.*, 1922, cxvi, 623.

The surgical treatment of chronic sciatica described is based upon an article by Renton. Ninety-nine cases have been treated in this manner with a successful result in practically all. The operation is to be used only in true cases of sciatica and after medical treatment has been tried. If the sciatica is due to a lesion of the spine, sacrum, hip joint, or other structure, these conditions should be cured. In certain cases the pain is due to a perineuritis which often is combined with neuritis with adhesions binding the nerve to the surrounding tissues. It is this type of case upon which the author operates.

A classification of the cases based on the clinical condition is as follows: (1) cases in which pain occurs only during exercise; (2) cases in which there is some pain during rest and intense pain during exercise; (3) cases with indefinite and irregular pain either at rest or during exercise.

In cases of Type 1 in which the inflammation has subsided but adhesions are present, the author's operation should give a cure in 100 per cent.

The operation demands a free incision from the gluteal fold downward, exposing the nerve as far as the extent of the pain. The nerve is hooked up with the finger but not stretched. The adhesion surrounding it is carefully dissected away either with the scissors or a scalpel, or with gauze and the fingers. No nerve branches are cut. The nerve is then carefully returned to its bed, the muscles are adjusted in place, and the skin is sutured. The patient is kept in bed three weeks and discharged at the end of four.

The author reports nine cases. Eight were completely cured. The ninth, which was recently operated upon, is still in the convalescent stage.

Marcus H. Hobart, M.D.

Sommer, R.: Cavernous Angiomata in the Peripheral Nervous System (Ueber kavernöse Angiome am peripheren Nervensystem). *Deutsche Zschr. f. Chir.*, 1922, clxxiii, 65.

Although cavernous angiomata are found frequently in the central nervous system, only two such neoplasms in the peripheral nerves have been reported. The author reports a case in which the tumor had its origin in the blood vessels of the posterior tibial nerve.

Angiocavernomata originating in the peripheral nervous system owe their origin to a malformation of tissue, viz., strangulation of an embryonic vascular branch in the endoneurium and perineurium. They are of interest only because of their situation. Pathologico-anatomically they are ordinary angiocavernomata. Their rarity is due to the extraordinary regularity of the intraneural blood-vessel formation which makes strangulation of the capillaries extremely difficult. The excochleation of these tumors is complicated by their intimate connection with the nerves, which usually must be resected. Harms (Z).

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Glass, E.: Tissue Necrosis Due to an Ink Pencil (Zur Tintenstift Gewebsnekrose). *Deutsche med. Wchnschr.*, 1922, xlviii, 1383.

In 1912, Erdheim reported nineteen cases of tissue necrosis caused by ink pencils. In this article Glass reports two cases.

Case 1. Four weeks before he consulted Glass the patient had had a fall on the forearm. This was followed by swelling which did not recede. When an incision was made a violet fluid escaped. The incisional wound closed, but four weeks later a protrusion as large as half a walnut developed on the forearm, there was considerable swelling of the surrounding tissues, and the patient's general condition became poor. Methyl violet was demonstrated in the bandage materials. The patient knew nothing of an injury from an ink pencil, but on examination of the wound, a broken piece of such a pencil was found in the necrotic cavity. The entire wound cavity was thoroughly excised. Uneventful healing resulted.

Case 2. In this case the broken-off piece of ink pencil was removed immediately but the injury caused necrosis of tissue, lymphangitis, and deterioration of the general health. Healing followed opening and débridement of the wound and the application of a 1 per cent alcoholic solution of trypaflavin.

The injurious factor is believed to be the methyl violet. The tissue necrosis tends to spread. The effect upon the general health is striking. The process of healing is very slow. Schubert (Z).

Von Balogh, E.: A Contribution to Our Knowledge of Noma (Zur Kenntnis der Nomainfektionen). *Wien. med. Wchnschr.*, 1922, lxxii, 1743.

The author gives a brief report of thirty-two cases of noma observed in the course of 2,000 postmortem examinations carried out during the past three years in the Department of Anatomy at the St. Ladislaus and St. Gerhard Hospitals in Budapest. A high percentage of cases coming to autopsy were those of undernourished children from poor families.

The majority of the subjects were under 4 years of age, but the disease is found also between the eight-

enth and twenty-fifth years. Twenty-two of the subjects were girls. The localization of the condition was variable, but it involved almost exclusively the large orifices of the body and the surrounding tissues. In fifteen cases it remained a completely isolated affection of the cheek. Measles was most often the primary disease (twenty-two cases); pneumonia and infectious intestinal catarrh were occasional causes.

The striking feature in the histologic findings, aside from thrombosis of the blood vessels and changes of varying degree ending, in the most severe cases, in advanced gangrene, was the failure of a defensive reaction in the apparently intact adjacent tissues.

By use of the original bacterial flora from cases of noma (a mixed infection of spirochætes and fusiform bacilli), the author succeeded in producing *in vitro* changes in excised muscles which greatly resembled true noma. The presence of a fusiform symbiosis suggests a weakness of the cells brought about by the primary disease. HOFFMANN (Z).

Paul, N.: Observations on the Origin, Causation, and Treatment of Rodent Ulcer. *Med. J. Australia*, 1923, i, 85.

While the etiology of rodent ulcer is still indefinite, it is a significant fact that although the lesion may occur in any part of the body, it usually appears on the face, more especially its central horizontal third. The sites of predilection are the eyelids, especially the inner and outer canthi, and the nasofacial grooves. As this region of the face is also the site of predilection of nevoid growths of an embryonic nature it is possible that stimuli or irritation of such tissues may lead to the formation of a rodent ulcer. Not only age, but also the actinic rays of the sun, may be factors in the production of retrograde changes.

Rodent ulcer may arise from the basal-cell layer of the epidermis or the corresponding portion of the pilo-sebaceous structures as a nevoid growth in which the germ or seed is present in the basal-cell layer and lies dormant until acted upon by certain stimuli. It may develop also from immature pilo-sebaceous structures or from another nevoid growth such as a mole. The neoplasms vary in appearance, depending on whether the cell rest is destined to form a hair follicle, a sebaceous gland, or a combination of these. When it is destined to form a hair follicle, the growth is characterized by closely packed cells, somewhat uniform and sharply circumscribed masses, and often a marginal palisade layer showing cells of a spindle shape. Sebaceous-gland structure is indicated clinically by large reddish masses (usually on the nose) and histologically by a reticular arrangement. There is also a combination of the solid or budding type with a reticular arrangement.

A neoplasm may originate in the epithelium of a pilo-sebaceous follicle or the basal portion of the surface epidermis as the result of traumatism or the effect of the actinic rays of the sun.

The treatment consists of irradiation with radium or the X-rays and excision. Radium is indicated in almost all cases and gives good results except where bone or cartilage is involved. Diathermy may also be of service but accomplishes little that cannot be achieved with radium. H. W. FINK, M.D.

McConnell, G.: A Case of Multiple Myeloma. *Am. J. M. Sc.*, 1923, clxv, 184.

This case report is particularly interesting in that the multiple myelomata occurred in a patient presenting clinically a pseudo-syphilitic syndrome. Postmortem microscopy seemed to prove the diagnosis of multiple myeloma although the patient, a negro 50 years old, had stated that he had both chancre and gonorrhœa thirty years previously, the aorta was dilated and calcareous, the pupils were irregular and unequal and had reacted sluggishly to light, a slight tracheal tug had been noted, soft areas were found in the sterum, clavicles, humeri, skull, cervical vertebræ, ribs, clavicles, scapulæ, femora, and the liver was enlarged.

No mention is made of the treatment of the chancre thirty years before, but repeated blood Wassermann tests, one spinal Wassermann test, and the Lange colloidal gold test were negative. Bence-Jones protein tests were repeatedly positive, thus adding weight to the differential value of this test in the presence of myelomata.

The extensive distribution of the tumors, which was typical, and their characteristic absorption of lime salts from areas of the bones involved made it possible that the calcareous deposits in the elastic membrane of the aorta and large arteries, the lungs, spleen, and pancreas resulted from derangement of the calcium metabolism due to the excess of calcium available from the absorbed areas.

The patient died eight months after the beginning of his disability. The urine had contained large amounts of albumin for some time previously and the kidneys contained calcareous deposits and were found sclerotic and fibrosed.

Microscopically, the tumors showed two types of cells—one having a round or oval nucleus staining deeply and surrounded by a narrow non-granular cytoplasm, and the other larger, with a larger nucleus, and surrounded by a large amount of cytoplasm which appeared cloudy. Mixed with these cells were multinuclear megakaryocytes and mononuclear cells with granular eosinophilic protoplasm.

DENNIS W. CRILE, M.D.

Bierich, R.: The Function of Connective Tissue in the Experimental Production of Cancer (Ueber die Beteiligung des Bindegewebes bei der experimentellen Krebsbildung). *Arch. f. path. Anat. u. Physiol.*, 1922, ccxxxix, 1.

The question whether arsenic, lactic acid, and the X-ray can initiate or cause an increase of definite pathological growths is considered in three experiments. For the purpose of this study experimental cancer produced by tar was chosen.

It was established that through the administration of arsenic, and later of a combination of arsenic and tar, a distinct delay in the appearance of benign superficial growths of the epithelium (an average of eighty days) and of malignant deeper growths (an average of one hundred and thirty-one days) was brought about. Neither an increase in the virulence of the transplanted tumor nor an acceleration in the formation of the experimentally produced tumor resulted from the use of lactic acid.

The effects of the X-ray were the same as those appearing after arsenic and in the first stage of tar cancer, namely, swelling of the epithelium, edematous breaking down of the skin and subcutaneous tissue, and, later, a marked increase in the elastic fibers, especially in the papillary body. In contrast to changes caused by the irritants named, these occurred in a few minutes.

The increase of the elastic fibers is caused by a saturation of the indifferent fibers with elastin; their regeneration in such a short period of time is precluded. This effect of the X-ray corresponds to the first stage of tar-, nematode-, and X-ray cancer, in which the elastic fibers are greatly increased in number as long as the epithelium has not grown into the connective tissue. In the second stage, when this is the case, the elastic fibers are almost entirely absent. It may be assumed that solution of the elastin saturation is caused by the cancerous tissue.

Two stages may be recognized in the change in tissue resulting from the use of tar, the X-ray, and arsenic. In the first there is an increase of certain epithelial functions. Accompanying this there is an increase in the formed elements of the connective tissue, especially those adjoining the epithelium. This depends upon a physiochemical change in the protoplasm of the connective tissue. In the second stage a diametrically opposite development takes place, namely, a breaking down of what was previously accomplished. The elastic fibers gradually shrink; the connective-tissue fibers are greatly twisted or are separated into thick cylinders. This also is caused by a change in the physiochemical structure brought about by cancer.

The fact that irritants such as tar, the X-ray, and perhaps arsenic, influence particularly both the epithelium and the connective tissue is a valuable addition to our knowledge of the development of experimental cancer. BUDDE (Z).

Lang, F. J., and Krainz, W.: Cystic Osteoplastic Carcinoma as Compared with the Scirrhous Form (Ueber das cystische osteoplastische Carcinom im Vergleich zu seiner verdichtenden Form). *Frankfurt. Zische. f. Path.*, 1922, xxvii, 526.

This article reports in detail two cases of osteoplastic carcinoma of bone which was primary in the prostate. The first case showed the usual picture as described by von Recklinghausen. In the portions of the skeleton which are most concerned in the mechanism of bodily movement, the vertebral column and the ribs, very marked changes were found and there was preponderating bone apposition due to the irritation of the nests of carcinoma cells proliferating in the marrow spaces. There was also congestion of the blood vessels of the bone. Bone destruction was present, but did not keep pace with the increased new bone formation.

The prostate belonging to the second case was lost in the confusion due to the war, but the fact of its tumorous degeneration is certain. This case was remarkable in that cystic formations, varying greatly in size, were found in the interior of the involved bones, but especially under the periosteum. There were also subchondral cysts in the femoral heads. Microscopically the cavities consisted of dilated gland lumina in the neoplasm. The author explains these formations on the basis of the great activity of the carcinoma cells, which in turn was due to the plentiful blood supply, the patient being only 27 years old. In the same way he explains the chiefly subperiosteal and subchondral situation of the cysts. BUDDE (Z).

Klemperer, P.: Parathyroid Hyperplasia and Bone Destruction in Generalized Carcinomatosis. *Surg., Gynec. & Obst.*, 1923, xxxvi, 11.

The patient, a woman 49 years of age, who had been operated upon for carcinoma of the breast eighteen months previously, was admitted to the hospital complaining of considerable pain in the back and showing evidence of metastatic cancer throughout the entire skeleton. Examination of the blood revealed 2,100,000 red blood cells, 3,800 white cells, and a hæmoglobin content of 18 per cent. Smears showed poikilocytes and normoblasts. The urinary findings were negative.

Autopsy revealed tumor metastases in the lungs and spine and the cranial and sternal bones. The left inferior parathyroid gland measured 30 by 5 by 3 mm., and was yellow, firm, and separate from the thyroid gland. Sections through the vertebræ showed extensive destruction of bone with replacement by a large number of cancer cells, chiefly by the formation of Howship's lacunæ. In other areas there was an extensive formation of osteoid and fibrous tissue.

The outstanding difference between this case and the usual type of bone lesion found in mammary cancer was the complete absence of calcification in the newly formed osteoid tissue. The author suggests the term "osteomalacia carcinomatosa" to describe the condition.

On section, the parathyroid tumor showed hyperplasia and, like the parathyroids, cells of medium size with large nuclei and a narrow cytoplasmic zone. Sections through the pituitary gland showed destruction of the posterior lobe and the intermediate zone by tumor growth. The anterior lobe was intact. The author calls attention to the fact that the entire destruction of the posterior lobe did not cause any change in the output of urine.

Osteomalacia has been found associated with hyperplasia of the parathyroid glands, but the

extensive bone destruction in carcinomatosis has not been considered heretofore in this connection. As in the case reported there was hyperplasia of the parathyroids and at the same time an entire lack of calcium deposit in the newly formed tissue, the author considers the hyperplasia of the parathyroid glands a fruitless attempt of the body to compensate for the calcium deficiency. In conclusion he states that the parathyroid glands should be examined in all cases of bone metastasis.

WILLIAM J. PICKETT, M.D.

BLOOD

Guthrie, C. G., and Huck, J. G.: On the Existence of More Than Four Isoagglutinin Groups in Human Blood. *Bull. Johns Hopkins Hosp.*, Balt., 1923, xxxiv, 37.

The authors briefly outline the history of the discovery of blood groups. Shattock is credited with being the first to recognize the grouping of blood. At first only three groups were identified. Landsteiner, in 1901, showed that blood grouping is independent of health or disease and follows certain laws. In 1902, the fourth group was demonstrated by Decastello and Struli. Jansky, in 1907, and Moss, in 1909, also found the group to which Decastello and Struli referred. Moss, Minot, and Brem, particularly, have thrown light on blood grouping. It has been thought that any unknown blood would fall into one of four groups. In the thirteen years following Moss' report, the status of four blood groups has remained unchanged, no group having been added or subtracted.

The authors of this article had a case of so-called "sickle-cell anæmia" under observation in which it became necessary to determine the blood group. Contradictory results were obtained. By the usual procedures the patient's blood was found to have reactions characteristic of both Group I and Group III; that is to say, the cells behaved like those of Group III and the serum behaved like that of Group I. This persisted for three months without change and all of the reactions were clear-cut.

The authors then investigated the patient's family. They were able to secure the blood of fifteen immediate relatives. Three other members of the family showed the same blood grouping as the patient.

Incidentally, the so-called "sickle cells" were found in several members of the family. Of those who exhibited the unusual blood grouping, two showed sickle cells and two did not. These unusual manifestations do not seem to be dependent on each other.

In the case of another patient whose blood did not conform to the usual requirements of the four groups the authors concluded after many trials with always constant results, that the patient belonged to a sixth group.

At present, Guthrie and Huck state merely that the blood of the first patient belongs to a Group III whose serum is devoid of Agglutinin B, and that the blood of the second patient belongs to a Group II whose red cells contain an extra agglutinogen.

S. F. ADAMS, M.D.

Tyler, M., and Underhill, F. P.: Does Menstruation Influence Blood Concentration? *Am. J. Obst. & Gynec.*, 1923, v, 155.

The present method of estimating hæmoglobin fails to show a constant variation characteristic of any one phase of the menstrual cycle. During some periods the hæmoglobin rises slightly but during others it falls. The change is not related to any symptom, such as headache, with which a rise in hæmoglobin has been associated by some writers.

The uniformity of the hæmoglobin percentage during menstruation might be predicted as the blood loss is certainly insufficient to cause a measurable decrease. Recent studies during menstruation showed a normal basal metabolism. Fatigue from measured work was as quickly overcome as at other times. The fact that there is no change in the hæmoglobin content and therefore in the blood concentration during menstruation is in accord with our present knowledge regarding the physiology of this function.

E. L. CORNELL, M.D.

Lehrnbecher, A.: The Theoretical Basis and Practical Application of Blood-Pressure Estimations in Surgical Operations (Die theoretische Grundlage und praktische Anwendung der Blutdruckmessung bei chirurgischen Eingriffen). *Beitr. z. klin. Chir.*, 1922, cxxvii, 291.

Blood-pressure estimations during an operation were recently urged by Koenig, Anschutz, and others. Lehrnbecher discusses his findings in 320 cases treated at the Nurnberg Hospital on the service of Burkhardt. He comes to the conclusion that determinations made before operation are of little practical value, and that only in cases of pronounced internal hæmorrhages does the method offer important aid in the differential diagnosis.

Knowledge of the blood pressure during an operation helps in estimating the depth of the narcosis. A fall in the blood pressure during an operation is the earliest sign of collapse and shock.

A comparison between the figures obtained immediately after the operation with those obtained before is of little prognostic value. Of considerably greater significance is the reaction of the blood pressure during the evening of the day of operation and the next day as compared with the determination made immediately after the operation. A considerable rise indicates a good prognosis. A blood pressure which is lower the evening of the day of operation or the next day than that obtained immediately after the operation is unfavorable.

In cases of postoperative bleeding, blood-pressure estimations are of the greatest value for the diagnosis and the evaluation of the therapeutic measures used. The efficiency of heart stimulants may also be gauged by blood-pressure estimations. This

method is particularly useful in estimating the good analeptic effect of intravenous narcosis.

NAGELLI (Z).

Nicolaysen, N. A.: The Transfusion of Blood in Acute Posthæmorrhagic Anæmias (Ueber Bluttransfusion bei akuten posthaemorrhagischen Anaemien). *Med. rev.*, 1922, xxxix, 289.

The author reports four cases of citrated blood transfusion and one case of autogenous blood retransfusion (extra-uterine pregnancy). In all of the cases there was a severe posthæmorrhagic anæmia. In one, this was due to hæmophilia. In two cases there was great danger to life and the transfusion seemed to save life though one patient died soon afterward from a repetition of the internal hæmorrhage. In the three other cases also the anæmia was very severe, but death was not so directly imminent. In one of these an immediate effect was noticeable. In the second there was a change in the entire course of the condition (hæmophilia). In the third, the immediate effect was less favorable because of an overlooked agglutination of the red blood cells of the donor, but the later effect on the regeneration of the blood was favorable. Only a single test with the red blood cells of the donor (citrated serum suspension) and the serum of the recipient was made before the transfusion.

The best test was found to be microscopic examination upon the glass slide.

The vein was always exposed and punctured under distention so that the blood poured forth in a stream and could be caught. Puncture with a hollow needle is dangerous because of the formation of coagula. Thirty cubic centimeters of a 2 per cent sodium-citrate solution were placed in a measuring glass into which 250 gm. of blood were caught and immediately mixed, and then another 30 c. cm. of sodium-citrate solution were added. As coagula form easily along the edge, the blood was filtered through several layers of gauze before it was injected. The donor was always a close relative of the patient. The donor experienced no unpleasant effect even when 1,000 c. cm. of blood were withdrawn.

PORT (Z).

Siperstein, D. M., and Sansby, J. M.: Intraperitoneal Transfusion with Citrated Blood: An Experimental Study. *Am. J. Dis. Child.*, 1922, xxv, 197.

The intraperitoneal transfusion of citrated blood in rabbits is a safe, simple, and efficient procedure.

Absorption of blood takes place very rapidly in the peritoneal cavity of rabbits. A rabbit can absorb approximately one-fifth of its own blood volume in four hours.

The intraperitoneal transfusion in both anæmic and normal animals causes a sharp temporary rise in blood values during the absorption period. This is followed by a more permanent increase.

Studies at necropsy, when considered with the blood counts, apparently indicate that the initial rise is due to the absorption of red blood cells from the peritoneal cavity, and not merely to concentration of the blood volume.

Pigeon's blood injected subcutaneously into rabbits apparently does not enter the general circulation in demonstrable amount. The same blood injected into the peritoneum is absorbed very rapidly.

The intraperitoneal transfusion of freshly citrated blood acts as a true transfusion, and not as the absorption of a nutrient material.

The intraperitoneal route for blood transfusions is proposed as a therapeutic method of merit.

SAMUEL KAHN, M.D.

BLOOD AND LYMPH VESSELS

Calzavara, D.: Wounds of the Common Carotid (Ferita della carotide comune). *Arch. Ital. de chir.*, 1922, vi, 433.

The high mortality of wounds of the common carotid artery is due not only to the severe immediate hæmorrhage but also to complications such as infection, secondary hæmorrhage, and the secondary severe cerebral lesions analogous to those following ligation of the carotid. The cerebral lesions are usually secondary to anæmic infarcts of the brain. Compensatory circulation by way of the circle of Willis or retrograde circulation from the external carotid may develop. Late complications may be caused by thrombo-embolism. When a clot forms in the artery at the point of injury, it may be carried later to the cerebral vessels to lodge either at a bifurcation or in the brain. The author mentions anomalies of the circle of Willis. The anterior (12 per cent) or posterior (7 per cent) communication branch may be absent or the internal carotid may not communicate with the vertebral. Some writers believe that the blood loss and lowering of the blood pressure are so great that blood cannot be forced through the circle of Willis, while others claim that arteriosclerosis interferes with collateral circulation. According to another theory, the insult to the carotid wall causes a spasm of its coats through stimulation of the vasoconstrictors, which shuts off the blood supply long enough to cause cerebral anæmia before the collateral circulation can develop. This time may be but a few minutes.

Experimental work on dogs and cats has not thrown much light on the subject with regard to man.

The author reports the case of a man 33 years old who was shot in the cheek, the bullet lodging beneath the skin of the neck. There was no temporal pulse on the left side. On the right side hemiplegia developed. At operation the bullet was extracted and the carotid was exposed. The internal jugular and vagus were intact. Part of the carotid wall had been carried away and the proximal end of the artery was occluded by clot. The clot was disturbed and the wound was packed as pulsation began. Death occurred at the end of twenty-two hours.

At autopsy a clot was found in the peripheral end of the common carotid, extending to the bifurca-

tion. The external and internal carotid, anterior and middle cerebral, and circle of Willis were patent and of normal caliber. There was no sclerosis. An anæmic infarct of the brain and an increased amount of ventricular fluid were present. In the author's opinion the anæmia was caused by persistent spasticity of the arterial walls. Immediate operation is indicated after such injury to insure surgical hæmostasis instead of insecure spontaneous plugging of the vessels. The arterial spasm may thus be relieved. KELLOGG SPEED, M.D.

Tichy, H.: A Case of Arteriovenous Aneurism of the Subclavian Artery with Reversal of the Circulation of the Arm: A Contribution to the Functional Transformation of Blood Vessels (Ein Fall von Aneurysma arterio-venosum der Subclavia mit Umkehr des Armkreislaufs: Ein Beitrag zur funktionellen Gefaessumbildung). *Zentralbl. f. Chir.*, 1922, xlix, 1501.

A former infantryman, 26 years old, was injured in the left shoulder, in 1915, by a bullet. An aneurism of the clavicular blood vessels resulted. The radial pulse disappeared. There was an exceptionally marked development of varices on the anterior surface of the left side of the chest, on the left upper arm, which was much enlarged, and half way down the forearm. The pulse was palpable in two of the varicose strands (those representing the cephalic and the basilic veins).

In 1921 a sudden aggravation of the condition made amputation of the arm necessary. At that time, the varix representing the cephalic vein was widely gaping and bloodless, and presented rigid, thick walls. The same was true also of a vessel which, by its position, represented the brachial vein. Another varix, representing the basilic vein, was thrombotic above. The brachial artery was collapsed, thin-walled, and full of blood. The histologic findings in the wall of the vein were as follows:

The intima was very considerably thickened. The muscle bundles in the media were separated from one another by a richly developed connective tissue. There were no muscle fibers in the externa. While the media did not contain many elastic fibers, the hypertrophic intima showed a very dense network. An internal layer of elastic fibers was distinctly recognizable. ZILLMER (Z).

Mueller, W.: The Treatment of Defects of the Walls of Blood Vessels by the Application of Rubber Protective Coverings (Zur Behandlung von Gefaesswanddefekten mittels aufgeklebter Gummischutzhuellen). *Zentralbl. f. Chir.*, 1922, xlix, 1287.

The author discusses Mocny's suggestion for the repair of defects in the walls of blood vessels.

In large and not too broad defects hæmostasis can be obtained by the application of a rubber covering when suturing is impossible. This procedure may prove to be better than ligation because the occlusion of the blood vessel occurs slowly so that time is gained for the development of a collateral circulation and necrosis of tissue is prevented. Attempts to obtain agglutination by means of rubber solutions are to be discountenanced. A suitably wide, soft rubber tube, split lengthwise, applied around the vessel and held together by loose coils of thread laid around it after the fashion of barrel staves accomplishes the purpose more easily and surely.

KALB (Z).

GENERAL BACTERIAL INFECTIONS

Miller, R. H.: Tetanus: A Report of 116 Cases at the Massachusetts General Hospital. *Surg., Gynec. & Obst.*, 1923, xxxvi, 90.

One investigator noted that tetanus often occurs only after the wound is dry and healing is well advanced. Another classifies cases of tetanus into three groups: (1) cases due to puncture wounds; (2) those due to cold or freezing; and (3) tetanus of the newborn.

Miller classifies the cases into two types: viz., tetanus ascendens or local tetanus, and tetanus descendens or general tetanus. In tetanus ascendens, the toxin, making its way directly to the cord, first involves the muscles of the wounded extremity, this being followed in some cases by general symptoms before death occurs. In tetanus descendens, which is by far the more common form, the involvement of the central nervous system causes, first, symptoms in the muscles of the jaws and neck and then more or less extensive involvement of the rest of the body.

A preventive injection should be given in every case of injury, however slight, in which there is reason to fear tetanus. This applies chiefly to dirty puncture wounds of the feet or hands, severe lacerating wounds of any part of the body, and especially compound fractures.

Since 1872, 116 cases of tetanus have been treated in the Massachusetts General Hospital. The total mortality was 69.9 per cent. Antitoxin was first used in 1896. Previous to 1896 the statistics included twenty cases, in which the mortality was 80 per cent. This demonstrates that a certain number of cases of tetanus will end in recovery even if they are not given specific treatment. Since 1896 there have been ninety-seven cases with a mortality of 67.7 per cent. This slight decrease in the mortality the author believes in due to more intensive and intelligent administration of antitoxin.

Of the last five cases under his observation, three recovered. The first was that of a school girl 16 years of age who was admitted to the hospital with a puncture wound of the foot. Treatment according to the symptoms caused the disappearance of signs of tetanus in seven days but the patient died of bronchopneumonia.

The second case was that of a man 44 years of age who was admitted to the hospital with a lacerated, infected wound over the right tibial tubercle, due to the kick of a horse. This was the first case

in which luminal was used. It had no untoward effect and proved of value.

The third case was that of a child 4 years of age who had infected numerous mosquito bites by scratching. It was not a very severe case and the patient recovered after the administration of 55,000 units of antitoxin.

The fourth case was that of a girl 7 years of age who had a puncture wound of the foot due to a nail. The wound was treated in the routine manner and antitoxin and luminal were given. This was a very severe case and, in the author's opinion, was saved by the treatment.

The fifth case was that of another girl 7 years old who had an infected wound of the upper arm. This was a severe case and seemed almost hopeless from the beginning. In spite of treatment the patient died.

The author concludes as follows:

1. Prophylactic injection of antitoxin should be given in every case in which there is the slightest possibility of the development of tetanus.
2. Excision and débridement of the wound is the first essential. The wound must be kept open.
3. The use of magnesium sulphate and carbolic acid is of doubtful value.
4. Sedatives must be used as indicated. Luminal is a valuable drug.
5. Antitoxin should be given in large doses by the intraspinal and intravenous routes and in small doses into the tissues around the wound.

GEORGE E. BEILBY, M.D.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Clark, A. J.: The Scientific Basis for Non-Specific Protein Therapy. *Brit. M. J.*, 1923, i, 315.

Clark reminds us of the increasing number of clinical cases greatly benefited by the judicious use of foreign proteins or the products of protein breakdown. These clinical successes, developed largely in America and Germany, have forced the attention of clinicians who, for the most part, were previously biased by the belief that, to be of value, such therapy must be of a specific nature. This article attempts to summarize the present status of scientific evidence regarding the nature of the effects of foreign-protein therapy.

Intravenous administration, when properly controlled, has been found a rapid and very effective method. It is indicated in acute infections such as typhoid fever, in which the foreign protein often causes a termination of the fever by crisis, and also in chronic infections such as arthritis, gonorrhœa, and anthrax. The reaction is more severe when the agent is given intravenously.

The febrile reaction is essentially the same whatever agent is employed. Sterile milk, purified casein, normal serum, purified proteoses, or peptones may be utilized. Bier believes that any agent causing the breakdown of body proteins will give a therapeutic result similar to the results of foreign-protein injections. Accordingly, radium, the X-ray, and the cautery give rise to the same febrile reactions by destroying tissue cells.

It appears probable that the common active principle in the protein reaction is a product of protein decomposition. The reaction is characterized by a rise in the temperature associated with an increase in nitrogen metabolism, contraction of the smooth muscles, increased glandular secretion, and increased permeability of the capillaries.

An excess of protein decomposition products is violently toxic. Hence the necessity of carefully controlling the dosage of the protein employed.

Perhaps the most important effect of protein therapy is the increased permeability of the capillaries, especially those of the liver and the skin. As a direct result of this there is an increased flow of lymph which washes the products of cell metabolism into the blood stream.

The chief blood changes consist of an immediate leucopænia followed by leucocytosis and an increase in fibrinogen, globulin, thrombokinase, and blood sugar. The proteolytic ferments become definitely more numerous. The antibodies are also increased. The bulk of evidence indicates that non-specific protein therapy results in the washing of cell and tissue fluids into the blood stream causing definite changes in the composition of the blood. Which of these changes is directly responsible for the beneficial clinical results is still unknown.

JOHN W. NUZUM, M.D.

Wildegans: The Histologic Processes Occurring in Skin Implanted by the Braun Method (Ueber die histologischen Vorgaenge bei Hautimplantation nach W. Braun) *Arch. f. klin. Chir.*, 1922, cxx, 415.

The author investigated the histologic processes in the skin grafting method of Braun, according to which pieces of skin, 2 to 4 sq. cm. in size, are sunk obliquely into the depth of the granulations. The implanted pieces of skin were removed after one, two, five, seven, eight, fourteen, twenty-one, thirty-five, fifty-one days, and six months, and examined in serial sections. Special attention was paid to the behavior of the implant (epidermis, the transplanted tissue of the cutis, especially the elastic fibers), and of the stroma (blood vessels, elastic fibers, connective tissue, and granulation tissue), the healing, and the clinical results.

The implant and the stroma showed direct agglutination. There was no exudate or fibrin layer. As a rule, signs of inflammation, marked filling of the blood vessels of the stroma, and diapedesis of polynuclear leucocytes were noted as a result of the foreign-body irritation. After forty-eight hours the derivatives of the connective-tissue cells and the vascular endothelia equalled the round cells in number. The injuries to the epithelium due to the cutting, the effect of air, drying, and squeezing were of short duration as after twenty-four hours progressive changes (amitotic figures) were already

recognizable. After forty-eight hours, conical proliferations of epithelium and a new formation of epithelial cells were visible.

The regeneration of the epidermis began in the cells of the stratum cylindricum and stratum spinosum. The adnexa of the skin (glands, sheaths of the hair roots) did not play any part. As the growth of the epidermis progressed, the graft canal was lined with epithelium which then spread over the surface of the granulations. Sections of the transplanted cutis were destroyed and the replacement occurred from the viable implanted connective-tissue elements and from the stroma. From the eighth day the border between the substratum and the implanted skin became indistinct. The connection with the circulation occurred through vascular sprouts from the stroma. Degenerative changes appeared early in the elastic fibers. The new fibers originated at the edge from the fibers of the stroma.

The skin grafting was done thirty-two times. The tendency to shrinkage was slight. The possibility of moving the graft on the substratum was limited in the beginning, but improved after eight to ten weeks. Sensibility was always reduced, but the sense of pressure was usually maintained. The final result was always a resistant, lasting skin. Epithelial cysts were not observed. FRANGENHEIM (Z).

ROENTGENOLOGY AND RADIUM THERAPY

Morton, R.: Deep X-Ray Therapy. *Am J. Roentgenol.*, 1923, x, 119.

Deep roentgen therapy is primarily a matter of roentgen-ray dosage since it is definitely proved that under certain well-defined conditions an abnormal cell is killed by an exposure to the roentgen rays that is insufficient to destroy normal cells. In estimating dosage, both primary and secondary radiation, including scattered primary rays, must be taken into consideration. For accuracy of measurement of the primary radiation it is essential that homogeneous rays be used as all the factors concerning these have been carefully worked out. Secondary radiation is more difficult to measure accurately, but it is known that at any given depth it increases directly, within limits, with the hardness of the tube and the size of the field irradiated. The charts prepared by Dessauer are of inestimable value as they make it possible to adopt a technique which will give an even irradiation of any lesion of moderate size at any of the usual depths.

Seitz and Wintz of Erlangen have evolved what may be justly described as the first complete system of roentgen therapy having a sound physical and biological basis. As a basis of dosage they use the unit skin dose. Working under their prescribed conditions, which are easily reproducible with the equipment they have evolved, this dose gives rise, after about five days, to a slight hyperæmia which gradually subsides, leaving the skin undamaged though pigmented or tanned. Taking this unit skin dose as 100 per cent, the limit of tolerance is as follows: muscle, 180 per cent; intestine, 135 per cent; ovary, 35 per cent; tuberculosis, 50 per cent; sarcoma, 60 to 70 per cent, and carcinoma 90 to 120 per cent. Forty per cent stimulates; 60 to 90 per cent paralyzes.

Measurement is carried out by means of the ionto-quantimeter or with Kienboeck's strips. The dosage is controlled by time alone when once the activity of the tube has been ascertained.

Certain factors have an important bearing on the probability of a successful result from irradiation. If the patient's general health is practically unimpaired, if the lesion is localized to a relatively small area and without wide local extensions, if every part of the growth is accurately, evenly, and thoroughly irradiated, and if the general health is carefully looked after during the subsequent weeks, it may be laid down as a general principle that the abnormal growth will disappear.

In the technique certain difficulties are encountered in practical work. If possible, no skin area or other normal structure should receive more than the unit skin dose. Overdoses, and also normal doses repeated three or four times, bring about an obstinate local œdema. These hard rays seem to have a special action on the local lymphatic circulation. Loss of radiation between the surface and the lesion beneath by dispersion and absorption must be compensated. Superficial conditions are easy to deal with. If only the skin is involved, a very even irradiation may be obtained by a long focal skin distance, the time being increased as the square of the distance. Central lesions are probably the easiest to treat with accuracy. The depth having been ascertained and the percentages from each port of entry being known, the lesion is attacked from as many points as necessary to build up the desired dose. The difficult cases are those with superficial lesions in which there is limitation practically to one port of entry and those in which the lesion is situated in parts of the body having an irregular contour, such as the jaws, the neck, the female breast, the vulva, and the anus. In this class of cases the difficulty has been partly overcome by covering the lesion with some material having the same absorption and secondary radiation value as normal tissues so as to make it a central lesion. Water, paraffin wax, beeswax, and dough made from ordinary flour are all suitable.

In conclusion, by way of encouragement, the author briefly reports several cases he has recently treated with encouraging results. One was an inoperable carcinoma of the breast in which the improvement was so great that surgical operation was given up indefinitely. A case of cancer of the œsophagus with practically complete obstruction was relieved of the obstruction and the patient regained his normal weight. A case of carcinoma of the pancreas was symptomatically cured and has remained so for twelve months. A case of cancer of the prostate was sufficiently improved to render catheterization unnecessary and the patient is well

and enjoying life. A patient with a rather hopeless sarcoma of the lung shows retrograde changes and appears to be in perfect health.

ADOLPH HARTUNG, M.D.

Wintz, H.: Injuries from Roentgen Rays in Deep Therapy. *Am. J. Roentgenol.*, 1923, x, 140

Aside from injuries attributable to careless or unskilled handling of the roentgen apparatus and overdosage, certain dangers are inherent in the agent itself when it is used, as at present, in deep therapy. These are divided into two groups: local and general.

In the first group are injuries caused by exceeding the limit of tolerance of the tissues and resulting from the defects of our present radiation technique. To give sufficient radiation to deep-seated lesions cross-firing is necessary, and regardless of an otherwise exact technique certain structures in the line of the rays may receive an overdose because of summation, this resulting in œdema or ulceration. Thus parts of the mucosa of the intestines or the urinary bladder may be affected when treatment is given for uterine cancer, or parts of the larynx or trachea may be injured when adjacent parts are irradiated. These injuries may be due to direct overdosage or result secondarily from vascular injuries.

Another factor responsible for injuries is the addition of a radiation intensity derived from uncommon secondary radiators whereby the radiation dose is increased though the primary radiation was correctly gauged and did not exceed the limit of tolerance of the tissues. Retained opaque meals, fæcal masses, and collargol injected into the urinary tract may act in this manner.

Lowered resistance of irradiated tissues to injury may be another cause of local injury and probably explains the so-called "late" injuries. If to the effect of the roentgen rays upon the cells another irritant is added which normally would cause no injury at all, the skin will respond to the summation of the two irritants with a distinctly recognizable reaction. Factors that may incite such a reaction are persistent pressure upon the irradiated part of the skin, the application of ice-bags or hot compresses, and chemical changes produced by the administration of internal remedies. Severe traumata of irradiated parts of the skin may cause serious injuries such as necrosis.

If the same dose is repeatedly employed in the same part of the body, the total of the macroscopically demonstrable injuries will produce a peculiar picture, namely, roentgen induration. The skin irradiated with a dose of 100 per cent of a unit skin dose, two times, or at the most, three times, at intervals of from six to ten weeks, becomes leathery and thick, feels tough and hard, and presents an œdematous appearance. The cause of these changes is undoubtedly to be found in vascular injuries and an increased permeability of the vessels. The other tissues, including the muscles and the connective tissues, will react in a similar manner. The power of resistance of tissue thus injured toward further additional injuries, such as traumatic or chemical noxæ or infection, is considerably lowered. If during the period of the infiltration (induration) the skin is protected against all injurious influences, the condition will recede in from one to one and a half years.

Far more dangerous is the infiltration of the pulmonary tissue, which may appear after irradiation of mammary carcinomata or lung tumors. The findings in such a lung resemble those of a central pneumonia. Fever is absent but there is a slight irritative cough. The affected part of the lung is, of course, useless. This condition is also comparatively harmless and will recede spontaneously in the course of one-half to three-fourths of a year. If an intercurrent disease (pneumonia or bronchitis) complicates the radiation induration, the prognosis is almost always poor.

A greatly increased reaction is to be noted with every gross change in the tissue because the roentgen treatment introduces an additional noxious agent. This increased reaction may be observed even when the skin is only slightly irritated. Attention is called also to the inflammatory reaction of the tissue following radiation of the ovaries in cases of diseased adnexa. The reaction will be increased also if the cells are not visibly changed and when a systemic disease exerts an injurious influence upon the cell.

In addition to the local injuries enumerated, deep roentgen therapy may produce certain general or systemic injuries on the operator as well as the patient. These include blood injuries and those due to inhalation of the air of the roentgen room and surges which can be avoided only by special devices. Acute blood injuries result from acute destruction of the blood corpuscles. They follow a long-continued irradiation and are observed only in the patient. Chronic blood injuries due to the effects of the roentgen rays as well as the "roentgen air" occur in the personnel of the X-ray room.

Destructive changes in the blood occur during each therapeutic irradiation for the destruction of pathologic cells. Their amount is directly proportional to the quantity of rays introduced and can usually be overcome if the patient's vital capacity is not too low.

The injuries caused by irradiation include also the so-called "roentgen Kater" or "roentgen indisposition." Changes in the biochemistry of the cells are produced by the roentgen rays through injury of the cell lipoids.

The general injuries occurring in persons using the X-ray are principally chronic blood changes consisting of a rather high percentage of eosinophilic leucocytes (10 to 15 per cent) and a leucocytosis (12,000 to 14,000), which appear after long-continued X-ray work. The injurious agents are found chiefly in the air which has been vitiated by the electrical surges and particularly by the ozone formed from the air by the roentgen rays.

Many of the dangers inherent in deep roentgen therapy cannot be avoided even by the best technical and medical construction of the apparatus and

the most thorough instruction of the technical and medical personnel. Others may be obviated if their existence is recognized and proper measures are taken. The knowledge of the therapeutic value of modern deep roentgen therapy will stimulate a systematic and correct investigation to avoid dangers and thereby contribute to the success of deep roentgen therapy. ADOLPH HARTUNG, M.D.

Halberstaedter, L.: Roentgen Carcinoma (Ueber das Roentgencarcinom). *Ztschr. f. Krebsforsch.*, 1922, xix, 105.

The author differentiates between two types of roentgen carcinomata: (1) those occurring as vocational lesions from the professional use of the X-ray in which the influence of the rays is produced over a long period of time, though in hardly measurable amounts, and (2) those resulting directly from investigations or treatment with the X-ray. The course of both is similar: drying of the skin due to the function-disturbing or destructive effect of the X-rays upon the sebaceous and sweat glands, the formation of rhagades, hyperæmic reddening, the development of pigment, the formation of horn-like accretions (hyperkeratosis), and vascular dilatation. The disease may become arrested at any stage, or more severe changes may gradually set in without further exposure to irradiation. Hyperkeratosis especially tends to carcinomatous degeneration. Chronic superficial ulcerations follow comparatively trifling injuries. The regional glands are attacked relatively late. The histologic picture is that of cornified squamous-cell epithelioma.

Tumor formation may result from the influence of the X-rays also in skin which was previously abnormal, as in lupus vulgaris, less often in lupus erythematosis, and occasionally in psoriasis.

Besides carcinoma, sarcoma may ensue. Experimentally this can be shown in the rat.

Disease conditions of the skin resembling the conditions caused by X-ray degeneration are xeroderma pigmentosum (Kaposi) and seaman's skin (Unna). Roentgen skin (X-ray skin), xeroderma pigmentosum, and seaman's skin have this in common, that they develop as a result of a physical irritation associated with radiations of short wave length. The appearance of pathologic changes is a question of dosage and hypersensitiveness.

The course of all three diseases extends over a period of years. Pre-eminent among the symptoms are the pathologic changes mentioned. In Orthsal's opinion these should be considered precarcinomatous. X-ray cancer is to some extent an involuntarily produced experimental cancer and exhibits a striking parallelism to the cancer produced in mice and rabbits by tar. SILBERBERG (Z).

Webster, J. H. D.: The Clinical Results of the Treatment of Malignant Disease by the X-Rays. *Lancet*, cciv, 373.

As in different cases radiation treatment is used as a prophylactic, a palliative, or a curative agent, the results of each should form a separate statistical group. Cases treated by prophylactic radiation in collaboration with the surgeon should constitute a distinct group subdivided according to whether the radiation is given before the operation or after, or both. Also the results of palliative radiation after many incomplete operations or in inoperable cases (and, perhaps, the majority of cases at present referred to the radiologist are in this group) should be considered separately. In only a small proportion of the cases referred for radiotherapy can an attempt be made to arrive at a definite cure.

Of the cases in which curative radiation is given the majority are cases of superficial epithelioma of the basal-cell type. The cosmetic results of roentgen-ray or radium treatment are better than those of surgical measures and the percentages of clinical cure are as high or higher. The chief causes of failure are inadequate or wrong methods of application. The results in cases of squamous-cell epithelioma are not as good as those in cases of basal-cell epithelioma because in the former there is frequently an early wide invasion and the lesion is of a more persistent type requiring more intense doses. The tongue is a most unfavorable site for any form of treatment, but clinical cures obtained by radiation, especially by methods of radium implantation, are recorded. When the roentgen ray is used, cases often fail to react to massive doses and improve when given repeated fractional doses administered within a period of a month or two at the most.

The treatment of breast cancer is one of the fields in which radiation may be expected to be of the greatest service in reducing the mortality or prolonging life beyond the average duration of two and one-half to three and one-half years. In this condition also the results should be grouped according to whether the treatment was given for prophylaxis, palliation, or cure. The best results published so far appear to be those of surgery and radiation combined. Poor results may be attributed largely to faulty methods or technique. In about 150 breast cases radiated in the past year the author has seen very few recurrences while a course of roentgen radiation was in progress. A considerable number of the patients coming for treatment have shown regression, at least temporarily. About five cases of recurrence in bone have been treated but the results so far are inconclusive. In two operable cases of primary cancer of the breast, one treated with the roentgen ray and the other with radium, the growth practically disappeared. Palliative radiation has a wide field, sometimes resulting in operability, or relieving the pain, ulceration, etc., or delaying further extension and the inevitable issue. In cases with ulceration the best results were obtained when zinc or other ionization preceded the radiation.

In cases of mediastinal growths a few clinical cures have been obtained, and a large number show temporary benefit. Testicular tumors are of great interest; of five cases at present under observation for extension into the lumbar glands or recurrence

after removal of the testicles, several responded satisfactorily.

With regard to malignant gynecological conditions there is a wide range of opinion as to the relative value of operation and radiation. Some European clinics report a high percentage of clinical cures from radiotherapy in both operable and inoperable cases, but insufficient time has yet elapsed to determine the permanency of such cures. Certain facts suggest that combined surgical and radiation technique, as in breast cases, may give better results than either operation or radiation alone. Inoperable cases have frequently been rendered operable by radium treatment. Like testicular growths, ovarian neoplasms are often very radiosensitive, and pelvic masses may sometimes regress quickly, relieving pressure or other symptoms. A number of cures of vulvar carcinoma obtained by radium and by the roentgen ray have been reported.

Gastric cancer was the first cancer to be treated by the roentgen ray but will probably be one of the last to yield to radiation or any other form of treatment. Compared with gynecological cancer, cancer of the stomach occupies a most unfavorable site, surrounded as it is by vitally important glands and other structures. Radiation is regarded as advisable after partial gastrectomy, but very few cases so treated have been reported. Primary cases with not very marked cachexia should be given the chance of roentgen-ray treatment as in some instances extraordinary results have been obtained by this procedure. Cancer of the colon sometimes reacts well, with or without resection or colostomy. Each case must be treated according to its particular requirements. Usually both surgery and radiation are indicated.

As regards sarcoma other than uterine sarcoma, the author believes that the conclusions of Perthes and Juengling may be generally accepted. These are as follows:

1. In all cases of inoperable sarcoma, even large gliosarcomata of the brain, the roentgen ray should be tried. The remarkable results in hypophyseal tumors are noteworthy.

2. Lymphosarcomata should be radiated rather than operated on, as they react well to radiation.

3. In periosteal sarcomata of the pelvis, shoulder, or limb joints better results are obtained with radiation than with operation.

4. Myelogenous sarcoma sometimes regresses without any treatment. The results of resection are good, but if amputation is considered, radiation should be tried first.

5. Maxillary sarcomata, if operable, should be resected; they are difficult to radiate satisfactorily and all the early recorded cases were underdosed.

6. Skin sarcomata should first be radiated. If refractory to radiation, they should be excised.

The results of radiation on a tumor which reacts well may be: (1) complete disappearance by absorption of the degenerated tumor cells; (2) lessening of the size of the tumor, but persistence of a residue, usually firm proliferative connective tissue (in some cases it may be advisable, if possible, to remove this by operation, but if not, it should be watched for many years for signs of renewed activity); or (3) reduction to a certain degree and then no further change, the tumor appearing biologically dead.

A rapid increase in size and generalization are sometimes observed in cases underdosed or refractory, or in which the neoplasm was already too widespread, and as septic malignant tumors sometimes slough rapidly after heavy radiation, fractional dosage methods are advisable if the case seems at all suitable for treatment. Local results, apart from those in the tumor, are usually temporary, such as those in the skin and the salivary and intestinal glands.

Undesirable general results from radiation are usually seen in the blood, the intestines, or the ductless glands. In a considerable series of cases not as much blood change was found as had been expected and there was no trouble with bowel sequelæ. In one stomach case there was slight but definite adrenal insufficiency for about two months, although only one adrenal received a considerable dose. Temporary general effects of radiation, such as roentgen sickness, are reduced in intensity by careful previous preparation of the patient.

It is the author's belief that cautious progressive present-day opinion is represented by the conclusions of Schmieden and Holfelder, which are as follows:

1. With few exceptions, every operable carcinoma should be operated on. Prophylactic postoperative radiation should be given also.

2. In addition to postoperative radiation, a single intensive radiation before operation is important.

3. Practically all inoperable carcinomata and all inoperable recurrences should be radiated. In many cases this gives a clinical cure; in others it results in operability, and in many in a decrease of the bleeding, irritation, and pain, and limitation of further metastasis.

4. Facial carcinomata, even when operable, may be treated exclusively by radiation for cosmetic reasons.

5. As a rule, sarcomata should only be radiated; certainly in all cases in which operation would cause considerable mutilation. An increase in the size of the tumor after an efficient radiation should not be considered proof of failure to respond as usually it is temporary.

6. In the treatment of malignant tumors the roentgen ray has become superior to radium.

7. The relative values of operation and radiation cannot yet be shown by comparative statistics.

Radiation treatment is in rapid process of evolution. Lines of advance are indicated as regards technique, studies of the physical and histologic side of biological radiation effects, and auxiliary therapeutic measures such as diathermy, ionization, etc. The author holds with Ewing that, whatever may be the ultimate value of radiation treatment used alone or as a combined method, the curative action of the

roentgen ray and radium is the first rational therapy of cancer ever devised from the point of view of immunity, because in its mode of action radiation calls on the body's forces to accomplish the cure

ADOLPH HARTUNG, M.D

LEGAL MEDICINE

Responsibility for Payment of Physician in Accident Case. *Fruin v. Glassnap*, 117 *Atlantic Rep.*, p. 547.

In this case there was a conflict of evidence between the physician and one whom he sought to charge for services rendered. A child was injured by a truck driven by Glassnap and carried by a third person into the office of Dr. Fruin. The physician immediately administered first aid and on examination discovered that the child was seriously injured and would have to be confined in a hospital for eight or ten weeks. According to Fruin, Glassnap came to his office soon afterward and on being told of these facts and that there would be a charge for treatment of the child, answered that he wanted Fruin to take the case and paid $10 to cover the expense of a roentgenogram. Glassnap denied that he had any conversation whatever with the physician concerning payment for services rendered or to be rendered, and stated that he paid no money.

The jury found in favor of the physician but it was claimed that error was committed by the trial court. The Supreme Court said: "This defendant (Glassnap) asserts that he stood in the position of a stranger who simply calls on a physician to care for one who, because of sudden injury, is unable to act for himself, and to whom the stranger holds no relationship which creates an obligation to furnish proper medical care. . . . In the conditions in which these parties stood, the burden rested on the plaintiff (the physician) to prove either an express promise by the defendant to pay the plaintiff for his services or circumstances or language from which his promise to pay might fairly be implied from the request he made. . . . From the evidence relating to the conversation between the parties and the time and circumstances in which it took place, and also to the payment of $10 on account, it might reasonably be found either that the defendant made an express promise to employ and pay the plaintiff for his services, or that he made a request of the plaintiff for his services which implied a promise to pay for them. As to the difference between these alternatives, the court did not sufficiently instruct the jury. It did not define an express promise or an implied promise." The judgment was accordingly set aside and a new trial ordered.

WILLIAM E. MOONEY

GYNECOLOGY

UTERUS

Kross, I.: Uterine Secretion: An Experimental Investigation into Its Effect upon the Coagulation of the Blood. *Surg., Gynec. & Obst.*, 1923, xxxvi, 217

One of the important problems confronting the gynecologist is that of so-called essential uterine hæmorrhage. It is quite obvious that before we can explain this pathologic condition we must first know the cause and the mechanism of normal menstruation. In the latter phenomenon the most striking feature is the fact that the hæmorrhage runs a strictly limited course in spite of the apparent incoagulability of the menstrual blood. Schickele showed that uterine extract retards the coagulation of the blood. Dienst holds that the factor responsible for the non-coagulability of menstrual blood is the anti-thrombin formed by the uterine mucosa; this, he explains, prevents clotting by neutralizing the action of the fibrin ferment. Excessive bleeding he ascribes to an excess of anti-thrombin. As far back as 1898, Bond showed that in animals the uterus has a definite secretion.

In a series of preliminary experiments the author attempted to investigate the effect of saline and distilled water extracts of human uterine mucosa, but his results were inconstant and contradictory, probably because his extracts contained other tissue juices and blood.

In his animal experiments eighteen young female rats were used. The uterus was exposed by a suprapubic median incision. In half of the animals a ligature was then tied below the bifurcation, and in the other half placed around one horn just above the bifurcation. The animals were then examined at intervals of one to three weeks by other laparotomies. In the successful cases a marked distention of the ligated portion of the uterus due to a clear opalescent fluid was found. This fluid was removed by means of a fine aspirating needle and tested against blood removed from the heart of the same animal or another of the same breed.

Later in the series of experiments the secretion from the uterus of the rat was checked against guinea-pig blood as well as human blood. The results obtained were the same. In all of the experiments the uterine extract delayed the coagulation of the blood by from two to eight minutes and when the clots were incubated with it they usually redissolved entirely.

Taken in conjunction with the findings of Whitehouse, Halban, Frankl, and others, the results of these experiments justify the theory that the cause of abnormal bleeding which cannot be accounted for on anatomical grounds [viz., the presence of a neoplasm, etc.) is a deviation from the normal in the secretion formed by the uterine mucosa.

C. D. Holmes, M. D

Tenckhoff, B.: Ventrofixation of the Uterus and Its Complications: Ileus (Zur Frage der Ventrofixatio uteri und ihrer Komplikationen: Ileus.) *Deutsche Ztschr. f. Chir.*, 1922, clxxiii, 36

The views of writers on the indications and the method of operation are still widely divergent. In regard to the indications Vorschuetz agrees in general with Kuestner, who ascribes an important part in all disturbances to retroflexion which is the first stage of prolapse and which he believes should be treated at the time of maturity. The Alexander-Adams operation is discountenanced. If an operation is done, the cavity of the lesser pelvis should also be exposed to view.

The incision generally used by the author is the alternating incision of Kuestner. The Pfannenstiel incision cannot be extended when necessary. If suppuration is feared, the median incision is employed. Vaginofixation and vesicofixation easily lead to disturbances in labor; like the Olshausen ventrofixation, they are applicable only after the climacterium or when simultaneous castration is to be done.

Ileus is a serious danger. Two cases due to fixation at the promontory have been reported by Oehlecker three by Barg, and others by Hastrup. This condition arises from strangulation of a coil of intestine in the vesico-uterine space, usually at the side of a loosely hanging round ligament. Unpleasant symptoms are produced by traction on the peritoneum. Recurrences are frequent, especially after the Alexander-Adams operation.

The Doléris-Gilliam operation avoids all these complications. In this procedure the round ligament is grasped about 2 to 3 cm. from its insertion in the uterus, and after the formation of a puncture canal through the rectus muscle, is fixed to the anterior sheath of the rectus with sutures. The lateral portion then passes to the inguinal canal as a tense band lying so close to the abdominal wall that no intestinal coil can slip through it: the dangerous slit is avoided. The sutures in the ligament are buried by a duplication of the fascia.

This operation was done 153 times. Two cases of ileus were found among fifty-seven examined subsequently. In these the uterus, which was partially adherent to the large intestine in the cul-de-sac of Douglas, had raised the large intestine with it, forming a kink. In order to avoid such an occurrence the uterus must be freed from adhesions. There was partial recurrence in only one case. In this instance laparotomy showed that the ligament was stretched

out into a thin peritoneal thread. Disturbances of labor were never observed. Two women died from pneumonia. Respiratory exercises and, in febrile cases, the administration of 0.2 gm. of optochin six times in addition to autogenous blood transfusion of 30 to 50 c.cm., eliminate the danger of pneumonia. Of twenty-two retroflexions, fourteen were symptomless, four were benefited, and four were not benefited. Of thirty-five cases, twenty-two were complicated. The method offers excellent results in both complicated and uncomplicated cases. KULENKAMPFF (Z).

Weiss, E. A.: Radium in the Treatment of Uterine Hæmorrhage of Non-Malignant Type. *Am. J. Obst. & Gynec.*, 1925, v, 128.

Eighty-three of the cases studied were cases of bleeding myoma. Only those in which the tumor was no larger than a three months' gestation were chosen for radium treatment. Intraligmentary or degenerating tumors were not considered suitable. In spite of favorable reports from other clinics, pedunculated tumors were also excluded from the series; likewise those suggesting degenerative changes. Any evidence of inflammatory changes in the adnexa, either acute or chronic, contra-indicates radiation.

Of all cases receiving full dosage forty were relieved at once and there was no return of the bleeding. Thirty-five of the women menstruated once, and fifteen menstruated three to five times. Ten received two treatments. The irregular bleeding for the first ten days after treatment is not to be attributed to the radium; it is rather the effect of the curettement, if not due to disturbance of the ovarian hormone. A large percentage of the patients had leucorrhœa in varying amounts for the first two to five months. Frequently this was very annoying and irritating. As a rule it was relieved best by douches of bicarbonate of soda. Probably the most annoying sequelæ were nausea and vomiting which occurred when the radium was *in situ*. In the cases of patients who were not anæsthetized these were often attributed to the preliminary doses of morphia, but the nausea was present in eighteen cases in which neither morphia nor gas was given.

With regard to the treatment of benign hæmorrhage from the uterus the author makes the following statements:

1. Radium should be used only in selected cases such as: (1) myopathic bleeding of adolescence which does not respond to the usual medical and hygienic measures; (2) bleeding myomata which are of small or moderate size and uncomplicated by adnexal disease; (3) the menorrhagia of the menopause.

2. The dosage depends upon: (1) the age of the patient; (2) whether the function of child-bearing is to be preserved or sacrificed.

3. Myomectomy should be performed in the cases of young women, and hysterectomy when the tumor is large or complicated, in preference to treatment with radium.

4. Complications and unfavorable results can be avoided only by a careful discriminating differential diagnosis.

5. All cases treated with radium should be carefully followed up for several years.

E. L. CORNELL, M.D.

Giles, A. E.: The Indications For, and the Results of, Myomectomy. *J. Obst. & Gynæc. Brit. Emp.*, 1922, xxix, 608.

One important indication for myomectomy is the child-bearing age. Myomectomy is the operation of choice up to the age of 40 years. In the author's practice, myomectomy has been performed on 52 per cent of women under 30 years of age, on 34.3 per cent of those between 30 and 35, on 19.2 per cent of those between 35 and 40, on 6.9 per cent of those between 40 and 45, on 51.1 per cent of those between 45 and 50, and on 10 per cent of those over 50. Myomectomy is indicated also by the association of fibroids with prolapse, this complication requiring the preservation of the uterus for fixation to cure the prolapse. Another indication is objection to hysterectomy on the part of the patient. In some women the loss of the uterus is apt to be followed by profound and persistent depression; X-ray treatment is therefore preferable. Myomectomy may be properly done also in cases of solitary or pedunculated tumors not associated with excessive bleeding

Hysterectomy is preferable to myomectomy after the age of 40 to 45; when fibroids are associated with bilateral tubal disease or ovarian tumors; when the uterus left will be battered and useless; when the fibroids cause excessive hæmorrhage; and when the patient demands a complete cure and will not consider any risk of failure.

Myomectomy is done during pregnancy only in the presence of urgent symptoms or for fibroids complicating labor. Surgical treatment of fibroids during pregnancy may be myomectomy, or a cæsarean section combined with myomectomy, or a hysterectomy at term. The indications for myomectomy during pregnancy are: (1) rapid growth of the tumor; (2) pain, pressure symptoms, or indications of septic or degenerative changes in the tumor; (3) when it seems evident that because of its position the tumor will obstruct labor. Myomectomy during pregnancy is a satisfactory operation.

RAYMOND E. WATKINS, M.D.

Bonney, V.: The Modern Scope and Technique of Myomectomy. *J. Obst. & Gynæc. Brit. Emp.*, 1922, xxix, 591.

The author reviews the history of myomectomy and tells of the difficulties encountered before the development of modern surgery. Reference is made to a remarkable paper read before the Liverpool Medical Society by Alexander describing a method of enucleating fibroids, the leading features of which were a median laparotomy, a single anterior incision in the front of the uterus, packing of the cavity left after the enucleation with iodoform gauze, and

ventral fixation. Because of the severe criticism of the operation at that time, it was discarded.

The author believes the uterus should be conserved in women in the child-bearing age for the following reasons:

1. Many women who have not borne children feel that they cannot justify their existence if all hope of reproduction is gone.

2. Hysterectomy is disturbing from a sexual point of view.

3. In women under 43 years of age child-bearing is possible if the uterus is conserved and the tubes and ovaries are healthy.

4. The removal of the uterus hastens the climacteric.

Bonney reports 100 cases of myomectomy in which from one to thirty fibroids were removed. The location of the tumor is of little importance. If necessary, the endometrial cavity may be opened. Cervical fibroids are the most difficult problem. Malignant degeneration, and necrosis and suppuration due to sepsis are contra-indications. In pregnancy, pedunculated or superficially placed fibroids can be removed without great danger of causing abortion. The removal of more deeply situated tumors is associated with greater risk. Bleeding is difficult to control. The recently delivered uterus is favorable for the enucleation of fibroids.

Menorrhagia and profound anæmia contra-indicate myomectomy, but moderate menorrhagic anæmia does not, provided all the tumors are removed and the remaining uterus is not too large for involution. In all cases of fibroids with menorrhagia the uterine cavity should be opened to make certain that no small fibroid on the mucous surface, mucous polypus, or great thickening of the endometrium is left. For the scraping away of thickened endometrium the author has found very efficacious the steel "finger nail" formerly used for the removal of adenoids.

In Bonney's cases the mortality of myomectomy was 2 per cent. One patient died of hæmorrhage, and another of shock. The chief danger is hæmorrhage. In no case, so far as is known, has there been a recurrence of fibroids. Five of the women have become pregnant one or more times since the operation.

With regard to the technique of the operation the author states that all tumors are removed through a single incision in the anterior wall. The fibroid most accessible through this incision is attacked first, and when this has been enucleated the next most accessible is reached by a secondary incision begun in the wall of the cavity left by the first tumor. If the tumors are located in the posterior wall, he goes through the cavity of the uterus. Redundant tissue is cut away and the cut edges are beveled inward to facilitate apposition in suturing. The uterus is closed with mattress and superficial sutures. In some cases anterior fixation of the uterus may be necessary. To control the ovarian vessels during the operation the author applies a ring forceps on the ovario-pelvic ligament. If the operation is apt to be difficult he also temporarily clamps the uterine artery on both sides. All four main vessels of the uterus may be safely ligated without fear of gangrene.

The article is concluded with the statement that, as a rule, fibroids do not necessitate hysterectomy, and that if all women with fibroids would submit to operation early, hysterectomy would never be necessary for this condition.

RAYMOND E. WATKINS, M.D.

Gordon, O. A.: The Treatment of Hydatiform Mole and Chorio-Epithelioma, with a Consideration of the Relative Frequency of Each. *Surg., Gynec. & Obst.*, 1923, xxxvi, 242.

Hydatiform mole is a condition in which there are characteristic microscopic and gross changes in the chorionic villi. Microscopic examination shows proliferation of the trophoblast elements, myxomatous changes in the stroma, and an increase in the syncytium. Grossly there is a characteristic grape-like mass of vesicles.

In the author's opinion, this condition is much more frequent than has been generally supposed. As it may be confined to a small area of the placenta, and as careful examination is necessary to discover the presence of a few vesicles, many cases must escape notice. Among 4,500 abortions at Bellevue Hospital in New York City there were twenty-one hydatiform moles (0.4 per cent). The mortality is at present variously estimated at from 10 to 25 per cent., at Bellevue Hospital it is 9 per cent. The causes of death are hæmorrhage, sepsis, and chorio-epithelioma.

Chorio-epithelioma is an extremely rare condition. That itis preceded by hydatiform mole in a large percentage of cases is a well-established fact, but this does not permit the conclusion that a large percentage of hydatiform moles are followed by chorio-epithelioma. In eleven years there has been but one chorio-epithelioma at Bellevue Hospital, and this was a doubtful case.

In view of the rarity of chorio-epithelioma and the frequency of hydatiform mole, the mole should be treated mainly to prevent hæmorrhage and sepsis. As the possibility of the development of chorio-epithelioma is remote, such radical treatment as hysterectomy is not necessary in all cases of hydatiform mole. Curettage also should be avoided as it is impossible to remove the larger part of the vesicles in this way and there is danger that the uterine wall has been thinned by the growth.

By far the larger percentage of cases will be successfully terminated by the manual removal of the hydatiform mole. In the event of irregular bleeding following this procedure, a laparotomy with hysterotomy should be performed. This will permit a thorough inspection of the uterus and may be followed by hysterectomy if evidence of chorio-epithelioma is discovered. In cases of chorio-epithelioma radiation should be efficacious both as a prophylactic and

therapeutic measure. The bilateral ovarian cystomata which are associated with both hydatiform mole and chorio-epithelioma in over 80 per cent of the cases are short-lived, show no evidence of malignancy, and undergo regression after the removal of the uterine condition. H. W. Fink, M.D.

Burns, J. W.: Chronic Endocervicitis and Its Treatment. *J. Obst. & Gynæc. Brit. Emp.*, 1922, xxix, 619.

This article is based on a study of eighty-four cases of uncomplicated endocervicitis.

This condition is most common in multiparæ between 30 and 40 years of age, next most common in women between 20 and 30 years of age, and least common in young unmarried girls. It arises from direct infection of the cervical canal as in gonorrhœa, infection of cervical wounds caused by labor or operation, or, as in the young girl with intact hymen, the direct upward spread of infection from the external genitals. In the cases of virgins masturbation may play a part.

As a rule the vaginal discharge is of a thick, white mucoid variety, but it may be thin, white, yellow, or green. Usually it is most profuse in the morning and before and after menstruation. General debility, lassitude, anæmia, backache, and constipation are other symptoms. Menstrual function is not influenced. In one-third of the cases there is pain in the left side. Complaint is frequently made of pruritis vulvæ. Thirty-seven per cent of the married women in the author's series were sterile, 39 per cent had had one or more children and no miscarriages, 27 per cent had had one or more children and one or more miscarriages, and 2 per cent had had miscarriages only.

Endocervicitis is of two forms—the acute and the chronic. The acute form is usually found in gonorrhœa and following infection of injuries of the cervix due to labor or operation. The chronic form may follow the acute or may arise as a chronic condition *per se*. The cervix may appear quite normal except for the thick, tenacious, yellowish mucus issuing from the os. Hypertrophy and erosion may or may not be present. Microscopic section shows: (1) hypertrophy of the glands; (2) blocked gland ducts; (3) small dilated cysts lined with low cubical epithelium; (4) areas in which the pavement epithelium has been shed; (5) round-cell infiltration; and (6) a varying degree of fibrosis.

A bacteriological examination of the cervix in sixty-six cases showed a positive growth of bacteria in culture media at the end of twenty-four hours in 92.5 per cent. The staphylococcus albus was found in 48.48 per cent, the staphylococcus aureus in 1.51 per cent, streptococci in 6.06 per cent, and bacillus coli in 13.63 per cent.

The staphylococcus albus was associated with the bacillus coli, streptococci, the gonococcus, and micrococcus catarrhalis and tetragenus in about 20 per cent of the cases. Dermatitis was present in 18 per cent.

With regard to the treatment the author discusses: (1) drugs and caustics; (2) curettage; (3) douching; (4) trachelorrhaphy; (5) vaccines; and (6) ionization. In Burns' opinion, ionization is the only scientific method of applying antiseptics to the cervical canal. Of thirteen cases in which the first swab was positive, only seven remained positive after one ionic application of 20 ma. for ten minutes, only five remained positive after the second application, and only two were positive after the third application. The technique of the treatment is as follows:

The patient is placed in the dorsal position with the knees drawn up, and a medium-sized glass Fergusson speculum is passed until the cervix fits into its upper end. The os is then dried and cleaned by means of small sterilized gauze swabs. A swab for bacteriological purposes is taken from the cervical canal and the reaction of the canal is determined by means of litmus paper. A malleable zinc sound is then passed into the cervix for 1 to 1½ in., and the speculum is filled with 0.5 per cent zinc sulphate solution. The zinc rod is connected with the positive pole of the galvanoset and the negative pole applied to the patient's thigh by means of a metal plate superimposed on two or three pads of gauze and lint wrung out in warm water. The current is then turned on, raised to 20 ma., and allowed to run for 10 to 15 minutes. By the end of this time the os and the cervical canal will be coated with a thick white deposit. The zinc sulphate is then mopped out and gauze soaked in 1:1,000 acriflavine is introduced into the vagina. The gauze is removed in twenty-four hours.

This treatment is repeated every seven days for three weeks, during which time no douching or intercourse is permitted. Three applications are usually sufficient to render the cervical canal sterile.

Some of the patients complain of a slight backache for forty-eight hours. In one case, in which there was a history of gonorrhœa eighteen months previously, an acute attack of pelvic inflammation was set up in forty-eight hours, and in one case of retroflexion menorrhagia was made worse.

Of the sixteen patients with erosion, two were definitely cured (no discharge for three to four months following the treatment); one developed acute pelvic inflammation; eight were benefited as far as the discharge was concerned but the erosion remained; two were not benefited at all; and three did not take the full course of treatment.

Of the twenty patients without erosion, thirteen were cured (i.e., no discharge for one to four months); two were not benefited (one had had a supravaginal hysterectomy previously and the other showed post-climacteric changes in the uterus and vagina); one became worse (retroflexion); and four did not take the full course of treatment.

It appears from these results that cases with erosion are improved but not cured, while those without erosion are greatly benefited. Cases complicated by pelvic inflammation or displacement of the uterus are not suitable for ionic treatment.

For cases with erosion the author advises removal of the erosion and the lower two thirds of the cervical canal by the Sturmdorf operation. Fourteen cases of chronic endocervicitis associated with erosion which resisted all forms of palliative treatment were entirely cured by this method.

The article is summarized as follows:

1. Chronic endocervicitis should be recognized as a distinct pathological entity apart from endometritis.

2. Any discharge from the vagina which causes discomfort is pathological and usually is due to chronic infection of the cervical canal.

3. The fact that a positive culture can be obtained in 92 per cent of cases proves that the condition is infective. In 50 per cent of the cases staphylococci, either alone or associated with some other organisms, are present.

4. Applications of various drugs, douching, tamponade, etc., give only temporary relief because the antiseptics do not reach the infecting agents in the lumina of the glands.

5. Ionization will cause marked improvement in cases in which erosion is not present.

6. For cases with erosion the only method which will bring about a cure is the removal of the lower two-thirds of the cervical canal, including the erosion. RAYMOND E. WATKINS, M.D.

Melson, O. C.: The Diagnosis of Cancer of the Uterus. *Minnesota Med.*, 1923, vi, 110.

Less than 50 per cent of the cases of cancer of the cervix or uterus coming to the Mayo Clinic are in the operable stage. In the series of cases studied the average duration of symptoms before clinical examination was seven months; the shortest time was one week and the longest two years and ten months. In the operable cases the longest duration of symptoms was twenty-five months, and the shortest, three weeks. In the inoperable cases, the shortest duration of symptoms was eleven days.

In order of frequency, the primary symptoms of cancer of the uterus were a bloody discharge, watery leucorrhœa, hæmorrhage, intermenstrual spottings, profuse leucorrhœa, frequent and prolonged menstrual periods, profuse menstrual periods, pelvic or low abdominal pain, bleeding after intercourse, and burning urination.

Any real advance in the treatment of uterine cancer must come through the medium of early diagnosis. Statistics show that in the early cases cure is the rule and recurrence the exception.

The examination should be not only digital, but also visual.

Hall, O. D.: The Use of Radium in Treatment of Cancer of the Cervix. *J. M. Ass. Georgia*, 1923, xii, 45.

The accessibility of both the squamous-cell type of cancer of the cervix and the adenocarcinoma renders them particularly well adapted to treatment by radium emanations. Reference is made by Hall to a report by Kelly and Burnham on the results of radium treatment in 213 cases. Of fourteen patients whose condition was operable, four are well from one to two years after the treatment. The remaining ten patients with an operable condition were operated upon and then given radium treatment. All are well from six months to three years later. Of the 199 inoperable cases, 109 were greatly benefited and fifty-three were clinically cured. Of thirty-five patients of this group with primarily inoperable cancers, three have remained well for four years, two for three years, and seventeen for one year. Eighteen are clinically cured, having remained well for periods ranging from one to six years. Reports made in 1920 by the American Gynecological Society discussed particularly whether operable cases should be treated with radium without primary surgery. Reports of cases so treated show results comparing very favorably with those obtained by surgery.

Clark and Keen point to the excellent results obtained with radium with relatively slight danger, and state their belief that radiation should be considered proper treatment for the so-called operable as well as the inoperable carcinoma of the cervix. Janeway cites figures showing that up to 1916 only six women were reported as having survived carcinoma of the cervix for five years or longer. By the use of radium, cures continuing for two to four years have been effected in cases in which the lesion was too extensive for operation. A factor of importance is the greater ease with which women are induced to accept radium treatment than surgical procedures.

Duncan states that relief from pain, hæmorrhage, and offensive discharge as well as prolongation of life and a relatively high percentage of clinical cures follow radium treatment.

Graves does not share in the condemnation of surgery in this type of case, but calls attention to the fact that surgical judgment as to what constitutes an operable case is of importance in determining the results of operative treatment.

The author divides his cases into four groups.

Group 1 consists of cases in which the disease is confined to the cervix. These are treated with 2,000 mg.-hrs. of radium, the radium being half the time in the cervix and half the time in the vagina, packed well up against the cervix with gauze. Ulcer of the rectum or rectovaginal fistula may be caused if the rectum is not protected by packing. This treatment is repeated in five or six weeks.

Group 2 includes inoperable cases with malignancy extending to the vaginal portion of the cervix, but with a movable uterus and no extension to adjacent organs. The danger in these cases is under-radiation. From 2,000 to 3,000 mg.-hrs. should be given at each treatment, with the technique used for Group 1.

Group 3 includes the cases in which the broad ligaments and adjacent glands are involved. An attempt is made in these cases to control hæmorrhage and pain, and to lessen the foul discharge. The pain is often not relieved, but the other two symptoms are greatly decreased.

Group 4 includes the postoperative recurrences.

Of the cases reviewed, ten were in Group 1, forty-three in Group 2, fifty-eight in Group 3, and five in Group 4. All of the patients in Group 1, twenty-six of those in Group 2, four of those in Group 3, and two of those in Group 4 are still living.

V. E. Dudman, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Hoon, M. R.: Fibromata of the Ovary. *Surg., Gynec. & Obst.*, 1923, xxxvi, 247.

In the Mayo Clinic from January 1, 1910, to August 1, 1921, fifty-five fibromata of the ovary not associated with other pathologic conditions were removed at operation. The diagnosis was confirmed by microscopic examination in every case. During the same period a total of 4,175 tumors of the ovary were removed. One hundred and forty-nine (3.5 per cent) of these were fibromata, but ninety-four were associated with cysts, either benign or malignant, or fibromata of the uterus, etc., for which the operation was performed. The incidence of ovarian fibroma is usually given in the literature as 2 per cent.

Infection, hæmorrhage, hyperæmia, inflammatory processes, and keloid formation may be factors in the origin of fibromata of the ovary. They are found at any age after puberty, but more often develop near the time of the menopause. In the series of cases reviewed the youngest patient was 18 years of age and the oldest 73. Twenty-six were menstruating, three were at the menopause, and twenty-six had passed the menopause. As a rule, menstruation is not affected by this condition, but the menopause may be delayed.

The symptoms are subjective and objective. The most common subjective symptoms are pain, dysuria, and frequency, constipation, and pain on defæcation. Objectively, the tumor is usually movable, but may be fixed by adhesions. The growth had been present for from a few months to thirty years, although in some cases the patient was unaware of even a large tumor.

Pain was present in thirty-three of the fifty-five cases. The tumor was movable in fifty-one. Ascites was present in fourteen (25 per cent), in amounts varying from 0.5 to 16 liters. In fifty-three cases the tumor was unilateral.

The diagnosis depends on the presence of a unilateral tumor of the pelvis, non-fluctuating, and separate from the uterus. In the differential diagnosis, pedunculated fibromyoma of the uterus, solid carcinoma, and solid sarcoma of the ovary, adenomyoma, etc., must be considered. In the presence of ascites, cirrhosis of the liver, abdominal malignancy, tuberculosis, etc., must be considered.

The treatment is surgical. Radium and the roentgen ray should be reserved for cases in which operation is contra-indicated on account of coexistent conditions such as serious cardiac lesions and nephritis.

The prognosis is good following surgical removal. Preoperatively, and when the patient refuses operation, the prognosis is influenced by the possibility of twisted pedicle, gangrenous peritonitis, or malignant degeneration.

The following conclusions are drawn:

1. Fibromata of the ovary may occur at any age after puberty; they constitute 3.5 per cent of all ovarian tumors.

2. There may be comparatively few symptoms, and the tumor may be present a long time without the patient's knowledge.

3. Ascites and tumor of the pelvis do not necessarily mean abdominal malignancy.

4. The treatment is surgical. All ovarian tumors should be operated on as soon as diagnosed.

5. The prognosis is good after operation.

6. Subsequent menstrual function is as normal as can be expected following unilateral ovariotomy.

7. Normal pregnancy may occur in women of child-bearing age when only one ovary or one ovary and one tube have been removed.

EXTERNAL GENITALIA

Markoff, N. W.: Bilateral Resection of the Pudendal Nerves for Vulval Pruritus (Doppelseitige Resektion der Nervi pudendi interni bei Pruritus vulvae). *Russk. Gynaek. Westnik*, 1921, i, 183.

The author reports a severe case of vulval pruritus in a virgin 43 years of age which proved refractory to numerous therapeutic measures. Finally the method of Kocher was used. Both internal pudendal nerves were exposed by dissection and the branches running to the genitalia were teased out with forceps. This resulted in anæsthesia of the labia, but did not affect the normal sensibility of the anal region. The pruritus entirely disappeared. Kozmic (Z).

MISCELLANEOUS

Curtis, A. H.: The Diagnosis and Relief of Sterility. *J. Am. M. Ass.*, 1923, lxxx, 393.

Laboratory study combined with clinical evidence leads Curtis to the conclusion that, in the absence of clinically demonstrable pelvic pathology, sterility is nearly always due to infection. Detailed study of grossly unaltered or slightly adherent fallopian tubes reveals that the mucosa is often crippled by healed inflammatory changes.

When opening of the abdomen in indicated in cases of sterility, air inflation of the fallopian tubes by means of a Luer syringe is performed as a routine, provided active infection is not found. By this simple procedure the presence of otherwise undemonstrable obstructions within the tube may be discovered, minor strictures may be overcome by forcible syringe pressure, the anatomical limitations of grossly palpable obtruction, possibly amenable to plastic operation, may be more definitely determined, and, at the completion of plastic operations on the tube, the patency of the lumen may be tested.

The author finds also that tubal inflation magnifies the regional anatomy, thus facilitating the study of

congenital defects and individual variations in tubal structure. "Lane kinks" of the peritoneal covering, previously unrecognized small diverticula, and other deviations from the normal are frequently revealed.

Von Albertini, A.: The Association of Different Malignant Tumors and Tuberculosis in the Same Organ (Kombination verschiedener maligner Tumoren mit Tuberkulose im selben Organ). *Schweiz. med. Wchnschr.*, 1922, lii, 1004.

Von Albertini reports an unusual case in which two very different kinds of malignant tumors and tuberculosis were found. This combination was observed once by Hildebrand in the lung. In the author's case chronic tuberculosis of the adnexa was associated with a carcinoma of the vaginal portion of the cervix and with a sarcoma of the fundus of the uterus which was surrounded by fresh miliary tubercles.

Very extensive statistics have led to the common belief that there is a certain excluding relationship between carcinoma and general tuberculosis. On the other hand, it must be assumed, on the basis of the literature and Ribbert's theory, that tuberculosis may predispose to the development of carcinoma. The author does not believe that in his case there was any reciprocal relationship between the older tuberculous disease of the adnexa and the neighboring carcinoma of the vaginal portion of the cervix, but he admits that there may have been a relationship between the sarcomatous nodule in the fundus of the uterus and the fresh miliary tubercles in its vicinity. He holds the view that the sarcoma obstructed the local lymphatic circulation so that the tubercle bacilli circulating in the lymph were arrested and their development was favored.

BRENNECKE (Z.)

Sellheim, H.: An Explanation of the Axial Torsion of Internal Organs and the Twisting, Encircling, and Knotting of the Umbilical Cord (Erklaerung der Achsendrehung innerer Organe sowie der Drehung, Umschlingung und Verknotung der Nabelschnur). *Munchen. med. Wchnschr.*, 1922, lxix, 1237.

Sellheim takes as an example the axial torsion of ovarian tumors. He attributes the twisting of the pedicle to habitual motion of the body or sudden external violence. The twisting of the pedicle of an abdominal tumor occurs more easily the more fluid the contents of the tumor. The axial torsion of tubal swellings and that of the myomatous, pregnant, or puerperal uterus and the uterus in the process of delivery is explained in the same way. The twisting tendency is opposed by friction which may prevent axial torsion. The twistings of the human umbilical cord are attributed to the transmission of the movements of the mother.

LINDEMANN (Z.).

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Welz, W. E.: True Eclampsia and Renal Eclampsia.
J. Michigan State M. Soc., 1923, xxii, 71

Renal eclampsia is divided into two types, that following chronic interstitial nephritis and that following chronic parenchymatous nephritis.

A history of nephritis may or may not be given in a case of renal eclampsia. Not infrequently renal injury occurred in infancy following an infectious disease, or has not been recognized, though present, during a period of illness antedating pregnancy by years. In cases of renal eclampsia due to interstitial nephritis the first half of pregnancy is characterized by a high blood pressure, polyuria, low specific gravity of the urine, very slight albuminuria, and, rarely, the presence of casts in the urine. The functional capacity of the kidney is decreased early and the decrease becomes more marked as the toxicity increases. Nocturia is usually present. There is slight or no œdema. As pregnancy advances, especially during the last four months, there is a considerable increase over the average high blood pressure for the patient. The systolic pressure commonly rises to between 200 and 300 mm. After delivery the drop in pressure is not great, the high average present before pregnancy being maintained. Cardiac hypertrophy is always present. There is a tendency to cerebral hæmorrhage as well as retinal hæmorrhage and optic disc atrophy. There are apt to be continuous headaches. The blood examination usually shows an increase of non-proteid nitrogen. The uric acid increases first, then the urea, and last the creatinin, just as in uræmia. Before the onset of convulsions, subjective signs, particularly amaurosis, give warning. These women frequently miscarry or give birth to premature stillborn infants without convulsions. After delivery all the cardinal symptoms of chronic interstitial nephritis remain.

Renal eclampsia due to chronic parenchymatous nephritis follows a different course from that resulting from chronic interstitial nephritis. There is usually a history of nephritis of the tubular type. In the severe cases there are typical symptoms of this condition before pregnancy begins. These consist of slightly increased blood pressure, a pasty complexion, slight anæmia, slight œdema, a decrease in the urinary output, and the presence of casts and a considerable amount of albumin in the urine. When the renal damage is slight, these symptoms may be absent or too poorly developed to attract the notice of the medical attendant. The blood pressure at the beginning of pregnancy may be so little above normal as to deceive regarding the presence of renal damage. The pressure runs the typical curve of toxicity as in true eclampsia, returning to the normal for the patient after recovery. The pressure does not rise so high as in the other forms of toxæmia, and at the peak attains a level which is lower than that of true eclampsia and much lower than that of renal eclampsia of the glomerular type.

Œdema is the most prominent symptom of this type. If it is not present at the beginning of pregnancy, it appears during the first few months. Usually it begins at the feet and gradually rises to the trunk. Œdema of the face and hands develops as the condition advances. As the kidneys fail in function, anasarca develops. Œdema of the lungs is apt to appear suddenly. After recovery there is gradual resorption of the fluid. During the stage of increment the retention of fluid in the body causes a decided increase in weight. With recovery there is a loss of weight up to 60 or 70 lbs. Abnormal urinary symptoms are always present at the beginning of pregnancy. Serum albumin is found in varying quantities from a trace to a very heavy deposit. As renal insufficiency develops, the percentage of albumin greatly increases. As œdema develops the output of urine is decreased. Casts are found in considerable numbers. At the stage of greatest insufficiency, red blood cells are usually found in the urine. Phenolsulphonephthalein tests indicate a very low renal functioning capacity. In marked cases albuminuric retinitis develops. There is a tendency for pregnancy to end prematurely. Recovery after the termination of pregnancy leaves the patient with characteristic symptoms of parenchymatous nephritis.

It is not always possible to distinguish the two types of renal eclampsia. Cases of true eclampsia are difficult to differentiate from renal eclampsia because they come under the observation of the obstetrician at the height of the disease, but true eclampsia is not difficult to diagnose if one is able to follow the case from the beginning of pregnancy through labor and the puerperium. The development of the toxic state during pregnancy and the recession to normal after delivery are very characteristic. True eclampsia is difficult to prevent, but the milder type can be controlled to a degree sufficient to prevent convulsions.

The prognosis is always graver when convulsions and coma develop. Women recovering from convulsive seizures return to their normal physical condition without impairment of vascular or renal function. Future pregnancies are not subject to eclamptic toxæmia and should terminate favorably for the mother and child. The fetal prognosis is grave even when convulsions do not occur.

Proper prenatal care will prevent most convulsive seizures and almost eliminate maternal mortality. Individualization must be the shibboleth in the care

of all toxic cases in late pregnancy. As soon as possible the type of toxicity should be determined. The care follows the lines of prophylaxis.

C. H. Davis, M.D.

Davidson, H. J.: A New Procedure in the Treatment of Eclampsia. *Surg., Gynec. & Obst.*, 1923, xxxvi, 280.

In this article the author presents additional evidence of the value of giving large amounts of fluid by mouth in the treatment of eclampsia.

When water is given by hypodermoclysis, it adds to the stagnant supertoxic fluids already in the tissues and tissue spaces, is absorbed slowly, and reaches the liver and kidneys fractionally. When given by rectum it is slowly absorbed, if retained, enters the hæmorrhoidal and inferior mesenteric circulation from viscera with poor absorption, and passes only in part by way of the portal. Water given by intravenous administration is disseminated throughout the systemic circulation, reaching the portal circulation greatly diluted and in fractional parts after having passed through two sets of capillaries, those of the lungs and those of the splanchnic area. Water given by way of the stomach is absorbed directly into the portal system and conveyed in highest concentration to the liver, yielding the greatest amount of electrolyte in highest concentration in a minimum of time. It is a significant fact that, in health, water is excreted by the kidneys more promptly if it is given by mouth than if given any other way. In further study of the biochemistry of water it may be found that it is not easily excreted by the kidney until it has been acted upon by the liver by way of the portal circulation. A surprisingly large quantity will be assimilated in a brief time. That most of the water taken by mouth is absorbed into the portal circulation is evident from the fact that however much is ingested, the stools do not become watery.

The author's treatment in postpartum eclampsia consists in first giving a large dose of morphia by hypodermic injection, 0.5 to 1 gr., repeated as indicated. Every four hours 1 to 1.5 liters of water is introduced into the stomach through the tube, the larger quantity unless signs of retching supervene, in which case the tube is quickly withdrawn. Regurgitation or vomiting has never occurred in the author's cases and he has never given less than a liter. In some instances the quantity has approached 2 liters. In a total of more than seventy gavages he has never recovered a drop of water introduced four hours previously. One to one and a half ounces of Epsom salts is given twice in the twenty-four hours, and 20 gr. of potassium acetate and citrate or some alkaline diuretic is administered with each gavage. Excessive bedclothing, artificial heat, hot packs, and bleeding are all discarded. By the method described, perspiration is obtained more promptly and far more copiously than by the old procedures.

The simplicity of the procedure makes efficient treatment possible in the poorest home. The flatulence is combated by means of eserin, pituitrin, hot stupes, and enemata. Cardiac stimulation is given if indicated, and spinal puncture is done if vision is affected and the eyegrounds show œdema of the disk. In cases of prepartum eclamptic convulsions the author regards it as advisable to use the duodenal tube as the stomach probably will not retain 1½ liters of water at once, while it is very easy to introduce that amount into the duodenum in a very short time. The tube may be left *in situ* if attendants can prevent its withdrawal.

In the series of twelve cases there were no maternal deaths. One child was lost because, following the cæsarean section necessary for its delivery, the physicians were so intent upon the mother that they failed to give the nurses explicit instructions regarding its care. This child died after a convulsion when it was twenty-four hours old. C. H. Davis, M.D.

Mussey, R. D.: Uterine Fibromyomata Complicating Pregnancy. *Minnesota Med.*, 1923, vi, 256.

The relative frequency of uterine fibromyomata is one to every eight white women and one to every three colored women. Fibromyomata are probably one of the causes of sterility. The writer reviews 101 cases of fibromyoma complicating pregnancy. Many women with uterine fibromyomata complicating pregnancy have no symptoms, but as most of those in the series sought advice on account of ill health, the percentage having symptoms was rather high. Pelvic or low abdominal discomfort was the chief complaint, this being present in 75 per cent.

Occasionally it is impossible to establish the diagnosis of early pregnancy in the presence of a uterine tumor. The importance of a careful history of the menstrual flow and of the rapidity of enlargement of the tumor is emphasized. In cases of doubt a waiting policy is recommended. The effects of pregnancy on fibromyomata are mentioned, namely, an increase in size with occasional incarceration of the tumor, torsion, degeneration, etc. The effects of fibromyomata on pregnancy may be miscarriage, hæmorrhage, dystocia, or puerperal complications.

The treatment of these cases is expectant and operative. Expectant treatment was given in 69 per cent of the cases, a report of which records seventeen miscarriages, ten premature labors, and thirty-six living babies. A follow-up of these cases revealed that only seventeen had operations for the tumor after confinement. The operative treatment included myomectomy in fifteen cases and a cæsarean or Porro-cæsarean operation in eleven cases. There were seven hysterectomies, three on uteri containing a macerated fetus; two in cases in which pregnancy was suspected but not definitely diagnosed until the uterus containing a degenerated tumor had been removed and opened; and two in cases in which pregnancy was not suspected until the tumor and uterus had been removed. From January, 1910, to January, 1922, there were 4,684 hysterectomies for benign uterine tumors and 741 myomectomies on non-pregnant uteri.

The author draws the following conclusions:

Most women with fibromyoma of the uterus pass through pregnancy and confinement without alarming symptoms and may be treated expectantly.

A careful history of the menstrual flow, with special note of the exact day and description of the last menstrual period, is of the utmost diagnostic importance in the examination of women with fibromyoma of the uterus, especially if the tumor is enlarging rapidly.

If there is the least doubt concerning the possibility of pregnancy the diagnosis should be delayed for several weeks or months, if necessary unless the symptoms are such that delay is dangerous.

An operation for fibromyoma of the uterus associated with pregnancy is sometimes indicated before the period of viability. This may be an abdominal exploration or a myomectomy. Exploration of this type of tumor might be made more freely; myomectomy is sometimes definitely indicated and the incidence of miscarriages following it is not unduly high. Hysterectomy is rarely indicated before the period of viability and should be resorted to only when the symptoms are alarming. It has not been necessary to advise hysterectomy prior to the period of viability in any case in which a diagnosis of fibromyoma complicating pregnancy with a living fetus was established.

The operation of election where operation is indicated is a Porro-cæsarean or cæsarean section at term.

Arey, L. B.: The Cause of Tubal Pregnancy and Tubal Twinning. *Am. J. Obst. & Gynec.*, 1923, v, 163.

The production of twins, separate or conjoined, and all non-hereditary malformations of organs and parts are reducible to a single causative factor, namely, a properly timed developmental arrest. This generalization constitutes one of the most notable contributions to modern embryology.

The fertilized ovum ordinarily takes a week or more in its passage to the uterus. During this period it does not normally become attached to the uterine tube. Any change which delays it in its progress favors tubal pregnancy. Impediments include abnormal diverticula, double tubes, kinking of the tube through adhesions, adherence of the mucosal folds (follicular salpingitis), epithelial diverticula, and impairment of the ciliated cells. Delay may occur also from migration from the opposite ovary. Since tubal implantation is definitely associated with preceding inflammatory changes, it follows that the mucosa has been injured, but at the time implantation is possible the inflammation must be largely healed. After the ovum is taken up by the mucous membrane at the outer end of the tube, its fate varies. When there is impairment of the ciliated cells it may be delayed in its progress until it becomes too large to pass into the uterus through the narrow portion of the tube. In other cases it wanders into blind pockets or epithelial diverticula. More commonly, it is transported to the middle of the tube, where inflammation and follicular salpingitis are most common, and there becomes lodged because the ciliated cell can carry it no further.

When blocked, the ovum may attack the tubal wall. In the meantime it has attained a later stage of development than is usual at implantation. Therefore, if such delayed implantation occurs with the establishment of tardy or inadequate oxygen relations at the critical moment for twinning, two embryonic axes assert themselves, as in the fish, chick, and armadillo, and monochorial twins result. This sequence of events is assumed from the application of Stockard's discovery to the known condition of the tube and ovum in tubal pregnancy and helps to account rationally for the preponderance of single-ovum twin pregnancies in the tube as compared with the uterus.

The production of uterine monozygotic twins and monsters is doubtless closely allied with, or even indirectly dependent upon, the same tubal conditions. A nearly healed or structurally modified tube may deliver the ovum to the uterus, although tardily; inflammation of the uterine mucosa alone may produce the same result. To what extent these factors operate separately and in combination must remain unsettled.

There is a demonstrable frequency of faulty implantations in tubal pregnancies. Under such conditions Mall failed to find a typical decidua; hence the possibility of checking hæmorrhage by the formation of a dam between the lips of the villi and the eroded mucosa is foregone. Numerous hæmorrhages result, which form old clots between the villi. "Even the best of specimens frequently show such extensive hæmorrhage around the chorion and such marked degeneration of the villi that it is a wonder the ovum continues to grow normally." Permanent or temporary setbacks occurring while the chorion is struggling to overcome natural deficiencies in its nidus are sufficient to account both for excessive twinning and for the observed double frequency of malformations in these specimens over the uterine group.

Studies of normal and pathologic tubal implantation convinced Mall that the primary causative factor of such monsters is faulty implantation which prevents an adequate transfer of nutriment. Stockard agrees regarding the primary element but from his experimentation is forced to believe the activating cause is a lack of sufficient oxygen.

E. L. Cornell, M.D.

Hawks, E. M.: Immediate Versus Delayed Operation in Cases of Collapse Following Ruptured Ectopic Pregnancy. *Surg., Gynec. & Obst.*, 1923, xxxvi, 232.

The proper time for operation in cases of collapse due to ruptured ectopic pregnancy is still in dispute. Of 824 cases of ruptured ectopic pregnancy reviewed by the author, 187 showed collapse. One hundred and thirteen of these urgent cases were operated upon immediately. Of the remaining seventy-four

patients, ten died of hæmorrhage unoperated upon. Three of the ten, through errors in diagnosis, did not receive regular palliative treatment. Omitting these three, the number of deaths in critical cases treated expectantly was seven (10 per cent).

The Medical Examiner's Office has recorded twenty-one deaths from hæmorrhage in the last four years. The records of the Board of Health of the Borough of Manhattan show that in 1921 there were twenty deaths from ectopic gestation, and that five of the twenty women died of hæmorrhage unoperated upon. Fatal hæmorrhage, therefore, occurs with sufficient frequency to warrant an attempt at immediate operation to prevent it.

In 113 cases operated upon immediately there were ten deaths, a mortality of 8.8 per cent. It would seem that better results were obtained from the immediate operation than from expectant treatment and deferred operation. In recent years methods of treatment have been so greatly improved that advocates of either procedure are loath to use statistics more than ten years old. In the twenty-one critical cases operated upon at the New York Hospital during the past six years there was one death. This was due to cerebral embolism and pneumonia and occurred on the fourth day after the operation.

H. W. Fisk, M.D.

Good, F. L., and Richards, T. K.: Ovarian Pregnancy. *Surg., Gynec. & Obst.*, 1923, xxxvi, 259

The authors' patient complained of pain in the lower abdomen and loins. Her temperature, pulse, and blood pressure were normal. She had had one previous full-term pregnancy. Amenorrhœa began thirteen months before her entrance into the hospital and persisted for eight months. For the past five months the periods had been regular. Physical examination was essentially negative except for the presence of a tumor the size of a six or seven months' pregnancy in the lower mid-portion of the abdomen. The cervix was not taken up and the os admitted one finger.

At operation the uterus was found normal in size and anterior to a tumor associated with the left ovary. The right tube and ovary were normal. The tumor was adherent to the lower end of the broad ligament and bladder in front and to the omentum and intestines. It appeared to be a large ovarian cyst with a pedicle thicker than is usual. When the sac of the tumor was opened a full-term fetus surrounded by foul-smelling puriform amniotic fluid was exposed. It was impossible to find any ovarian tissue on the left side.

The specimen was a slightly oval mass measuring 21 by 19 by 11 cm. and weighing 2,520 gm. (5½ lbs.). The fetus was well developed. The legs, hands, and finger nails were perfectly formed, and there was no evidence of gill clefts or other embryonic structures indicating prematurity. The placenta was attached to the inner wall of the mass at the end opposite the head. Microscopic sections taken from many places showed nothing but dense fibrous tissue, corpora lutea, and a few distended ovarian follicles. In one series of sections a cross-section of the oviduct was found. The tube was intact but the fimbriated end was spread out over the mass. Apparently the fimbriated end had become attached to the ovary at some previous time so that when the ovum became impregnated and the ovary enlarged, the tube became stretched across the surface of the organ and was caught in the fibrous tissue eventually formed.

H. W. Fisk, M.D.

LABOR AND ITS COMPLICATIONS

Haynes, L. W.: Acute Complete Inversion of the Uterus. *J. Michigan State M. Soc.*, 1923, xxii, 75

One of the important predisposing causes of acute complete inversion of the uterus is to be found in the fundal attachment of the placenta, as first suggested by Thorn. Haynes believes, however, that too great emphasis has been given to errors in the conduct of labor for if undue pressure on a relaxed uterus from above or too great traction on the cord were of great importance we would hear of many more cases than we do. If the figures the author has collected are of any value they show that the condition is becoming more frequent in spite of continued improvement in obstetrical technique.

Inversion has occurred twice in subsequent labors in the same patient when all precautions were taken to prevent it. Carruthers reports two inversions in the same woman in consecutive labors. This would lead to the assumption that in some cases there is a special predisposition.

The diagnosis of acute complete inversion is not difficult. As a rule the process of inversion is complete in a few seconds. One subjective symptom is pain. In the case reported by the author the patient was under ether anæsthesia but she made several sharp cries as if in great agony. In cases of mild subacute and incomplete inversion this symptom is not often present.

The second symptom is that of shock out of all proportion to the amount of blood lost. The pulse becomes small and quick. Some writers attribute the collapse to the reduction of pressure in the abdomen. In Haynes' opinion this is not a good explanation. Herman has suggested that it is due to strangulation of the uterus and sudden exposure of the sensitive internal uterine surface.

In earlier years about three of every four women so affected died. More recently most writers give the figures as one in four.

The author considers the treatment under two separate headings: (1) when shock is severe, and (2) when shock is not severe. In severe shock he removes the placenta if it is attached and gently presses the uterus into the vagina. The hæmorrhage is stopped by a hot saline douche, by giving ½ to 1 c.cm. pituitrin, and, if necessary, by constricting the uterus just below the cervix with a piece of sterile rubber tubing. The usual treatment for shock is then given. When the patient has rallied

sufficiently, replacement is attempted. Deep ether anæsthesia should be used. The lithotomy position is helpful. The left hand is placed over the lower abdomen while the right hand is passed into the vagina behind the uterus, grasping it and gently pushing upward and forward toward the left hand. If necessary, the pressure is kept up for ten to twenty minutes. In cases in which such manœuvres are not successful it is best to pack the vagina or use a bag or repositor. When these fail, a gynecological procedure is necessary.

When shock is slight, the uterus should be replaced at once if possible. C. H. DAVIS, M.D.

Waldstein, E.: The Classical Cæsarean Section under Local Anæsthesia with Temporary Fixation of the Uterus (Klassische Kaiserschnitte in Lokalanaesthesie mit temporaerer Fixation des Uterus). *Wien. klin. Wchnschr.*, 1922, xxxv, 825.

In 1914, Traugott and Jurié reported on cæsarean sections they performed under local anæsthesia. No doubt this has been done frequently since then but has not been reported in every case.

The author reports three cases in which the general condition (severe pulmonary tuberculosis in one and decompensated mitral stenosis in two) made it necessary to perform a cæsarean section under local anæsthesia. After the administration of 0.02 gm. of morphine the abdominal skin and the parietal peritoneum were infiltrated with 50 to 60 c. cm. of a 0.5 per cent solution of novocaine with the addition of a few drops of adrenalin solution. It is very important to prevent the protrusion of the abdominal contents during the operation. Therefore the author applied tenacula to the uterus before incising it as in this way he was able to close off the wound in the abdominal wall as if with a pad and to prevent the entrance of amniotic fluid into the abdominal cavity and traction on the uterine ligaments.

SCHUBERT (Z).

NEW-BORN

Greenhill, J. P.: The Association of Fetal Monstrosities and Deformities with Placenta Prævia. *Surg., Gynec. & Obst.*, 1923, xxxvi, 227.

To fifteen cases of the association of fetal monstrosities with placenta prævia which he found reported in the literature the author adds six others, including two of his own.

In explanation of such cases Greenhill states that for some reason the ovum is implanted in the lower uterine segment, that when this occurs the relation between the placenta and the fetus is faulty, and that the faulty relationship is responsible for the arrest of development.

Thirteen of the twenty-one monsters mentioned in this article showed cranial or intracranial defects. According to Mall, the heart or the central nervous system is the first to be destroyed in the embryo.

In conclusion the statement is made that since fetal monsters are not infrequently associated with placenta prævia, it is advisable, when cæsarean section is contemplated in cases of placenta prævia, to attempt to ascertain by physical and X-ray examination whether the fetus is deformed or not.

H. W. FINK, M.D.

Weverinck: Intraperitoneal Infusion (Ueber intraperitoneale Infusionen). *Deutsche med. Wchnschr.*, 1922, xlviii, 1577.

The author used intraperitoneal infusion at the Children's Clinic at Dusseldorf for the quick administration of water to water-impoverished nurslings. Seventy-two infants were treated in this manner and more than 100 injections were given. Sixty of the infants died and twelve recovered. In one case peritonitis, and in another, shock developed. The condition for which the treatment was given was in most cases a severe intoxication with atrophy and dysentery. In dermatitis or sepsis, subcutaneous infusion or drip infusion was chosen.

In the intraperitoneal infusion the site of injection is the middle or lower third of a line from the navel to the spine of the ilium. The skin is disinfected with alcohol, ether, or iodine. A 100- to 200-c.cm. syringe fitted with a long injection tube with its point cut off short, and a rubber tube or connecting piece is used. The skin is not divided with a scalpel or scissors. The layers of the abdominal wall are penetrated by slight pressure. The fluid injected is physiological salt solution, Klinger's solution or, less frequently, a 10 per cent solution of glucose. The youngest infants are given from 100 to 200 c.cm., and older children, 400 c.cm. After the injection, hot packs are applied to favor absorption, and adrenalin and caffeine are given.

Although it does not always save life in cases of severe nutritional disturbances, the author believes that the intraperitoneal infusion of fluid is to be preferred to its subcutaneous administration because of its simplicity, certainty, and painlessness. The danger of peritonitis is slight, even in the most severe cases in which the resistance of the body is low. Strict asepsis, however, is essential.

SONNTAG (Z).

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Hammer, H.: A Case of Bilateral Subacute Suppurative Pneumococcic Paranephritis (Ein Fall von beiderseitiger, subakuter, eitriger Paranephritis pneumococcica). *Ztschr. f. urol. Chir.*, 1922, xi, 1.

The author reports a case terminating fatally in which there was moderate fever associated with puffiness of the face, dyspnœa, cramp-like abdominal pain, and anuria. Cystoscopic examination showed an obstruction in the left ureter; the right ureter was normal.

At autopsy, a gelatinous, suppurative inflammation of the capsule was found around both kidneys; there was also a pyelonephritis. Pneumococci were the cause of this unusual type of suppuration. The fact that the process ran an insidious course for months was probably due to the nature of the excitant.

Rost (Z).

Sears, N. P.: A New Method of Making Ureteropyelograms. *Surg., Gynec. & Obst.*, 1923, xxxvi, 274.

The advantages of the technique described are that it is simple, the ureter is filled from below without disturbance of its natural course by the passage of the catheter, and reflux of solution about the catheter is prevented.

A wax spindle about 2.5 mm. in diameter is placed on the whistle-tip catheter about 1 to 1.5 cm. from the tip. The catheter is threaded back through the cystoscope in the usual way of passing wax tips described by Harris and Hinman, and the instrument is introduced, the catheter with the bulb being passed into the ureter to be studied so that the bulb is held by the bladder wall. The tip of the whistle-tip catheter is thus permitted to enter the ureter. The other side is also catheterized, urine being collected from each for study. The patient's shoulders are elevated slightly and a 14 by 17 X-ray plate is placed under the back so that it inclines downward at an angle of about 10 to 15 degrees. The ureter and pelvis are then gently filled in the usual manner.

If the patient is flat on his back the upper ureter does not fill, probably because, after crossing the iliac crest, the fluid flows rapidly to the pelvis and causes the pain of distention, prohibiting further injection. The Trendelenburg position permits the kidney to fall upward; it thus disturbs its usual position and does not give true information. After the picture is taken the catheter may be passed up or, if the bulb interferes, another catheter may be passed to drain the fluid in place of the opposite one, which may be removed. However, the fluid usually flows back more quickly when the catheter is low in the ureter than when the older method is used.

By this technique accurate information regarding stricture or kink can be obtained and obscure causes of pain can be located.

C. R. O'Crowley, M.D.

Fullerton, A.: Aches and Pains of Renal Origin. *Canadian M. Ass. J.*, 1923, xiii, 85.

The author reviewed the records of over 1,500 successive cystoscopies to determine whether the condition of the kidney or ureter or the site of the lesion could be correlated with pain of a particular type or distribution. He found that the most extensive disease of the kidney may not cause any pain whatever, and that, on the other hand, very slight pathology may be associated with almost unbearable agony; also that the same condition may cause only slight discomfort in one case, while in another it causes pain of a very severe character radiating to the utmost terminations of the peripheral nerves.

Pressure on the normal kidney produces pain of a sickening character, which is less severe but similar to that of pressure on the testis or ovary. The pelvis and ureter are highly sensitive. Distension of the pelvis is definitely painful. Certain reflex phenomena, such as nausea, vomiting, pallor, and cold sweats associated with disturbance of the pulse or respiration, commonly accompany the pain in the renal pelvis. In pathologic conditions the sensitiveness of the kidney and ureter may be profoundly altered.

Papin and Ambard classify renal pain as follows: (1) that due to mechanical or traumatic causes such as distension of the ureter, pelvis, and calices, distension of the parenchyma in the capsule by congestion or œdema of the kidney, the contact of a foreign body with the walls of the pelvis or calices, dragging of the pedicle of the kidney, compression of the nerves (most of the pain, however, is reflex or of a toxic nature), and sclerosis of the kidney; (2) inflammatory conditions such as lesions of the pelvis and calices, as in pyonephrosis, lesions of the parenchyma, as in pyelonephritis, and lesions of the perirenal cellular tissue, as in perinephritis and perinephritic abscess.

Papin and Ambard are of the opinion that renal pain usually arises in the renal pelvis. In cases of calculus, hydronephrosis, movable kidney, renal tuberculosis, cancer, and renal hæmaturia, obstruction of the ureter is manifested by renal colic due to distension of the pelvis. Pain in the kidney itself is generally of moderate intensity except in cases of inflammatory lesions, in which it may become very severe.

The fact that the most varied pathologic conditions may give rise to almost identical symptoms suggests that a common cause may be present in all,

namely, distension of the renal pelvis by obstruction. This obstruction may be due to a calculus, a kink, a thickened ureter, or a blood clot. The intensity of the pain is no index whatever of the severity of the lesion; a very slight kink of the ureter may produce more severe pain than an extensive hydronephrosis. The direction of the radiation of the pain is usually toward some portion of the lower extremity but sometimes to the groin, the testis, or labia majora. Not infrequently the pain radiates to the opposite renal region, and occasionally is felt solely on the presumably healthy side. In the so-called Dietl's crises the pain may be due to torsion of the pedicle, kinking of the ureter, or dragging upon the pylorus, gall-bladder, or other abdominal structure. It may be suggestive of an acute abdominal condition with rigidity. A typical attack of renal colic is usually easy to diagnose, but occasionally the surgeon will encounter cases in which every examination fails to make the conclusion certain. This suggests that in exceptional cases extra-renal conditions may be responsible for colic similar to that arising from renal causes. In many cases the pain of renal origin must be looked upon as referred pain, its distribution not necessarily giving any clue to the location of the lesion in the urinary tract.

Abdominal examination will reveal displacements, deformities, or enlargements of the kidney, swellings in the renal region, tenderness, rigidity, or areas of hyperæsthesia. Rectal or vaginal examination may locate a calculus in the lower end of the ureter, thickening of the ureter, tenderness, or other abnormality. Negative urinalyses do not exclude renal disease. A small aseptic stone may be present in the absence of blood, pus, or albumin in the urine. In hydronephrosis the usual tests may show a normal urine, and at the time of examination a pyonephrosis may be blocked. The X-ray examination, if properly done, may reveal alterations in the position, shape, and size of the kidney in addition to opacities. Cystoscopy may demonstrate alterations in the shape, size, and surroundings of the ureteral orifices and changes in the rhythm and character of the efflux. Ureteral catheterization will show the character of the urine from each side and any alteration of the relative specific gravities. The divided kidney function test with indigo-carmine or phenolsulphonephthalein may give valuable information. The ureteral catheter will demonstrate narrowing or patency of the ureter, and pyelography will show the shape and size of the pelvis and calices, the presence and relations of foreign bodies, and the position, direction, and caliber of the ureter. If these methods fail to establish a diagnosis an exploratory operation will be necessary.

Renal calculus. In cases of renal calculus the pain is frequent, severe, and of varied character. Occasionally it may be due to the passage of crystals of oxalate of calcium. Frequency of urination occurs especially during the attacks of pain, and the severe attacks are very frequently characterized by reflex vomiting, pallor, and cold sweats.

Renal tuberculosis. In tuberculosis of the kidney, pain is not a cardinal symptom. It was present in fewer than half of the author's cases, and in these there was usually thickening of the ureter as well as very extensive destruction of the kidney substance. The pain is probably due to obstruction causing intra-pelvic pressure, but the chronicity of the disease allows of more gradual distension than that occurring in cases of stone.

Pyelitis. In pyelitis, pain is very frequent. The acute cases are characterized usually by rigors, fever, vomiting, pain, and tenderness, and sometimes by palpable swelling of the affected organ and muscular rigidity. The pain is usually more fixed and constant than that occurring in cases of calculus and tuberculosis, and not so severe as that due to calculus. Its cause is probably the passage of purulent coagula along the ureter.

Hydronephrosis. In hydronephrosis the conditions are most favorable for the development of renal colic, viz., obstruction and distension of the renal pelvis. A frequent history is that of pain and a tumor in the side, often associated with vomiting. In some of these cases an anomalous renal artery extends across the ureter like a bow-string, constricting it and causing obstruction and pain by dilating the renal pelvis. In some cases the pain is of recent development, being due to kinking at the ureteropelvic juncture resulting ultimately from the gradual dilatation.

Renal tumor. In cases of renal tumor, pain may be entirely absent, but was present in about 60 per cent of the author's cases. It ranges in character from a soreness, a dragging pain, or tenderness to very severe renal colic. In most of the author's cases it appeared to be due to blood clot in the pelvis or ureter.

Movable kidney. Pain is often present in cases of movable kidney, but as this condition is so often associated with other evidences of visceroptosis it is difficult to apportion the responsibility among the various organs. The diagnosis can usually be made by means of pyelography.

Other causes. It must be borne in mind that renal pain may be due to some condition of the bladder or urethra as in cases of obstructive growths or stricture of the urethra. Also to be considered are certain rare conditions such as certain forms of chronic nephritis, infarcts, hydatid cyst in which small cysts are sometimes passed, other cysts of the kidney, and horseshoe kidney.

Treatment. The treatment includes, of course, removal of the cause when possible, but in certain ill-defined renal neuralgias the usual methods are often either insufficient or excessive, as Papin and Ambard have pointed out. While decapsulation, nephrotomy, and nephropexy sometimes fail to effect a cure nephrectomy is too drastic. Papin and Ambard have suggested resection of the nerves of the kidney. This is done after careful exposure of the renal pedicle and dissection of the vessels.

C. D. Holmes, M.D.

Major, R. H.: The Use of Creatinin as a Test of Renal Function. *J. Am. M. Ass.*, 1923, lxxx, 384.

In normal persons and in persons suffering from various diseases without renal lesions, the intravenous injection of 0.5 gm. of creatinin was followed by an increased excretion of urine in one hour amounting to three times that excreted during the hour preceding the injection. The total excretion at the end of two hours amounted to five times that of the hour before the injection.

In chronic nephritis the kidney fails to respond in this manner. In the cases studied the increase was less than 50 per cent. In a number, no increase was noted.

H. A. McKNIGHT, M.D.

Barney, J. D.: Gonococcal Infection of the Kidney. *J. Urol.*, 1923, ix, 79.

This article is based upon a case of gonococcal infection of the kidney which is of interest because of the complete pathological and bacteriological study made. According to the author, twenty-seven cases of gonococcal infection of the kidney have been reported in the literature but in only four or five was the kidney studied at operation or autopsy.

Before coming under his observation the author's patient had been subjected to an epididymotomy. A cystoscopic examination was made because of pain in his back. Redness and œdema of the left ureteral orifice were found. The urine obtained from the left kidney by ureteral catheter showed intracellular diplococci. A nephrectomy was done. The kidney was about the size of a pullet egg. The renal pelvis was thin and greatly dilated. The ureter was normal. Recovery was uneventful.

HERMAN L. KRETSCHMER, M.D.

Ball, W. G.: Some Cystoscopic Appearances in Tuberculosis of the Urinary Tract. *Brit. J. Surg.*, 1923, x, 326.

The purpose of this article is to describe some of the pathologic changes which may be observed in the bladder in cases of genito-urinary tuberculosis.

The author calls attention to the extreme rarity of primary tuberculosis of the bladder. Many writers deny the existence of such a condition, and it is generally agreed that in about 80 to 90 per cent of cases of vesical tuberculosis the primary focus of infection is in the kidney.

Symptoms indicating involvement of the kidney are of slow development and may be absent altogether, even when the kidney has been destroyed. As the first evidence of the disease is often dysuria associated with frequent micturition, the ability to recognize the appearance of the condition in the bladder by cystoscopic examination is of great importance in the diagnosis and especially in determining which kidney is at fault.

The author uses a general anæsthetic in making a cystoscopic examination when tuberculous infection is suspected. He cautions against overdistention of the bladder in such cases in order to prevent hæmorrhage and irreparable damage, such as the lighting up of a latent lesion or the introduction of a secondary infection which might result from even slight trauma.

Excellent illustrations are included in the article to show the various points made in the discussion of the different aspects of renal tuberculosis and to demonstrate the character of the lesion in the early stages of bladder involvement.

The earliest cystoscopic finding is the discharge of blood, pus, or caseous material from one or both ureteral orifices. The author contends that the persistence of hæmaturia and pyuria observed by the cystoscope as coming from one kidney fully justifies exploration of that kidney.

Broadly speaking, the degree of involvement of the bladder wall is an indication of the extent of the disease of the kidney. Ball does not agree with the general view that patients often exhibit reflex symptoms of vesical irritation prior to the appearance of bladder lesions. In his own cases he has usually been able to find a change when such symptoms begin, although it does not necessarily exhibit the characteristics of a tuberculous lesion. He believes it possible, however, that lesions of the lower end of the ureter may give rise to vesical symptoms in the absence of involvement of the bladder mucosa.

The early and later changes of lesions in the bladder are more or less fully described. One of the most striking illustrations shows an ulcer found in the bladder of a man complaining of vesicle symptoms who had been subjected to the removal of the right testicle for tuberculous disease several months previously. At the time this picture was made, there was a hard nodular seminal vesicle under the site of the ulcer. Attempts to prove that the kidneys were infected were negative.

EDWARD F. HESS, M.D.

Chetwood, C. H.: The Treatment of Pyelitis. *J. Urol.*, 1923, ix, 87.

This article deals with the treatment of pyelitis with neosalvarsan. Attention is called to the fact that old salvarsan is of no value. Mention is made of work previously done by Necker, Kall, Nathan and Reinecke, and others. The technique is the usual method employed. The solution used is freshly prepared in recently boiled and distilled water. The average initial dose is 0.15 gm. of the drug. Subsequent dosage according to effect varies from as little as 0.05 gm. to as much as 0.3 gm. The total number of doses is usually four. These are given at intervals of three to five days.

Two cases are reported in which this form of treatment was used. HERMAN L. KRETSCHMER, M.D.

Hinman, F.: Experimental Hydronephrosis: The Significance of Compensatory Hypertrophy and Disuse Atrophy to Repair. *J. Am. M. Ass.*, 1923, lxxx, 315.

Experiments conducted by the author not only confirmed the fact that renal reserve and compen-

satory hypertrophy effect a counterbalance after unilateral nephrectomy, but demonstrated also that in unilateral diseases without nephrectomy an additional factor, renal competition, is active in the final anatomical readjustment. Activity is just as essential for renal growth as for muscle hypertrophy. Progressive inactivity leads to a disuse renal atrophy. On the other hand, an overwhelming demand for work produces renal inactivity, and renal atrophy would be demonstrable in such cases if death did not occur from renal insufficiency.

The significance of renal reserve power and compensatory hypertrophy and of renal competition and disuse atrophy in relation to reparative operations on the kidney is obvious. The poor results of repair procedures in hydronephrosis are not always due to technical failures. Attempts to repair a unilateral hydronephrosis when there is a complete compensatory hypertrophy on the opposite side are always certain to fail, and if the diseased side has been greatly injured or infected or the repair procedure is imperfect, success is not certain even if there is partial compensation on the normal side. In bilateral disease conservative surgery is always indicated and it is necessary to repair the two kidneys at two different operations. The second operation cannot be delayed too long because the initial reparative operation may have placed this kidney in such a favorable condition as to allow it to undergo complete compensatory hypertrophy, in which case atrophy will surely result on the unoperated side.

LOUIS NEUWELT, M.D.

Watson, E. M.: Spontaneous Healing in Destructive Pyonephrosis: Report of Two Cases. *Bull. Buffalo Gen. Hosp.*, Buffalo, 1923, i, 18.

This article is summarized as follows:

"Two cases are reported showing cystoscopic and radiographic evidence of healed renal disease with reduced renal function and absence of active infection. Both cases give a history of a severe illness in earlier life which may have been accompanied by acute renal infection. The evidence at hand suggests spontaneous healing of renal infection in both cases, with permanently reduced renal function and fibrotic changes in the kidney structure indicating a process of repair."

GILBERT J. THOMAS, M.D.

Kampmeier, O. F.: A Hitherto Unrecognized Mode of Origin of Congenital Renal Cysts. *Surg., Gynec. & Obst.*, 1923, xxxvi, 208.

To determine the cause of congenital renal cysts the author made a microscopic study of the embryological development of the kidneys of human fetuses. He found that in fetal life there is normally a stage characterized by the presence of numerous cystic renal tubules. This normal process is converted into a pathologic condition if the tubules do not give way at the proper time and continue to grow to the detriment of the adjacent normal structures.

THOMAS F. FINEGAN, M.D.

Crawford, R. H.: Polycystic Kidney. *Surg., Gynec. & Obst.*, 1923, xxxvi, 185.

In a case of bilateral cystic kidney the author discovered a hereditary tendency. The patient had three aunts and four uncles; one was found to have a polycystic kidney on exploratory examination but is still alive; three of the seven died of uræmia due to polycystic kidney. In the patient's family, in which there were nine children, eight are living but six have easily palpable kidney tumors. Three of the latter have had kidney operations. The author's patient died from uræmia following drainage of the cysts.

Polycystic kidney is congenital and practically always bilateral. Heredity plays an important rôle. Nephrectomy is not indicated, even though one kidney appears normal, because the remaining kidney almost invariably becomes cystic.

THOMAS F. FINEGAN, M.D.

Kretschmer, H. L.: Echinococcus Disease of the Kidney. *Surg., Gynec. & Obst.*, 1923, xxxvi, 196.

Echinococcus infection confined entirely to the kidney is rare. In the literature of the United States and Canada Kretschmer was able to find only seventeen cases of echinococcosis with kidney involvement.

The case reported in this article was that of a male Greek, 32 years of age, who complained of pain in the region of the right kidney, frequency of urination, pain on urination, hæmaturia, and loss of weight. These symptoms began one year ago with an attack of hæmaturia lasting two weeks. Two days after this attack he passed a small round body, the size of a pea, which he described as soft and containing small particles of gravel. Two weeks after the first attack of hæmaturia he had a second attack, but there had been none since then. During the year he had had twelve attacks of pain lasting for several days.

Kidney and bladder cultures were negative. Phenolsulphonephthalein appeared in six and one-half minutes on the right side and in six minutes on the left. The kidneys were not palpable or tender. There was an eosinophilia of 8 per cent. The roentgen examination showed a shadow near the upper pole of the right kidney. At operation this proved to be an area of calcification. When the right kidney was exposed its upper half was found to be occupied by a firm mass 20 cm. in diameter which contained many small cysts. Nephrectomy was done.

Ten months after the operation an echinococcus fixation test with human cyst fluid was negative. The treatment of choice is nephrectomy

THOMAS F. FINEGAN, M.D.

Cumming, R. E.: Leucoplakia of the Renal Pelvis. *Surg., Gynec. & Obst.*, 1923, xxxvi, 189.

Leucoplakia of the renal pelvis is rare. The bladder is more frequently involved; here the condition is readily recognized by means of the cystoscope.

The normal transitional epithelium is replaced by a stratified squamous epithelium showing various degrees of keratinization.

The etiology has not been established. Syphilis and alcohol have a relation to leucoplakia in other parts of the body but are not related to its renal phase.

The symptoms are those of related conditions and, in addition, the painless passage of epithelial membrane.

Nephrectomy is advised for advanced cases. In the case reported in this article the entire renal pelvis was lined by a dry scaly substance resembling bran. THOMAS F. FINEGAN, M.D.

Stevens, W. E.: The Diagnosis and Treatment of Malignant Tumors of the Kidney. *California State J. M.*, 1923, xxi, 60.

Hæmaturia, pain, and a palpable tumor are generally recognized as the three cardinal signs of malignant tumor of the kidney. To these, a fourth should be added, viz., a characteristic deformity of the renal pelvis revealed by pyelography. In a review of 413 cases of malignant kidney tumors reported in the literature, Stevens found that hæmaturia, pain, and enlargement of the kidney were present at the time of examination in only 44 per cent, but pyelography revealed a deformity of the kidney pelvis or calices in almost every instance in which it was used.

Deformities revealed in the pyelogram, such as narrowing or displacement of the pelvis, with or without elongation and narrowing of the calices, are almost always characteristic of renal tumor. Visualization of the gastro-intestinal tract by air inflation or by barium meals or enemata is often of great assistance in determining the location of an abdominal mass. Other aids in the diagnosis are the occasional presence of neoplastic cells in the urine and the profuse bleeding which sometimes follows the traumatism caused by the ureteral catheter.

The diagnosis of the histologic type of a malignant tumor of the kidney is sometimes impossible but in many cases can be made from a careful study of the symptoms together with the cystoscopic and roentgenographic findings.

As the prognosis of all malignant tumors is practically hopeless without operation, the kidney should be removed in almost every instance unless definite metastases are found. Occasionally the X-ray and radium are of value after operation. If the fatty capsule is involved, it should be removed with the kidney. This necessarily includes removal of the suprarenal capsule. The lumbar or extraperitoneal route is preferable for the removal of small or medium-sized tumors and the abdominal route for the removal of large growths. In all operations the renal vein should be ligated as far as possible from the kidney. Early ligation prevents the entrance of the malignant cells into the general circulation following the manipulation of the kidney. In cases of papillary epithelioma of the renal pelvis the entire ureter should be removed with the kidney as a rule since involvement of the ureter will occur later if it is not already present. LOUIS GROSS, M.D.

Huebner, F.: The Operative Treatment of Cystic Dilatation of the Vesical End of the Ureter (Zur operativen Behandlung der klappigen Erweiterung des vesicalen Ureterendes). *Ztschr. f. urol. Chir.*, 1923, xi, 25.

After a detailed description of the disease picture of cystic dilatation of the vesical end of the ureter, Huebner reports a case in which Baetzner performed an operation consisting of the insertion of a ureteral catheter, suprapubic cystotomy, longitudinal splitting of the cystic ureter over the catheter, removal of the resulting flap of mucous membrane, and suture of the ureteral and vesical mucosa. Recovery followed.

Endovesical treatment by slitting, cauterization, or thermocoagulation comes up for consideration in cases of small, thin-walled dilatations without complications in the bladder or the upper urinary passages, but in cases of larger dilatations, infection, nephrolithiasis, and ureterolithiasis, the transvesical procedure is necessary. The article is supplemented by a bibliography. VORDERBRÜGGEN (Z.)

Herman, L.: Accidental Bilateral Occlusion of the Ureters. *J. Urol.*, 1923, ix, 151.

The case reported was that of a woman 21 years of age who was subjected to supravaginal hysterectomy for chronic tubo-ovarian inflammation with pelvic peritonitis. Forty-eight hours after the operation examination showed marked changes about both ureteral openings, the absence of urine in the bladder, and obstruction of both ureters 2 in. above their vesical openings. The pelvis was immediately explored. The ureters were located on the pelvic wall lateral to the stump of the uterus. The left ureter was dilated to the size of the little finger. On following this ureter toward the bladder, an obstruction due to an encircling catgut ligature was found. This ligature was cut and through a minute incision made into the ureter a probe was passed into the bladder to demonstrate the patency of the lower segment of the tube. The right ureter, which was dilated to the size of the index finger, exhibited active peristaltic and reversed peristaltic waves which gave it a peculiar snake-like action. Through a minute incision a probe detected an obstruction due to one ligature, and an inch below this a second obstruction due to another ligature. Ureteral catheters were left in position for drainage. During convalescence there was no leakage of urine from the incisions in the ureters. Three months later the urine was normal and sterile, catheters passed easily to each pelvis, and there was no evidence of renal or ureteral dilatation.

From a review of the literature it is evident that bilateral ureteral occlusion is rare. The author has collected and tabulated twenty-four cases. In fifteen cases (62.5 per cent) the occlusion was due to encircling ligatures, and in two the ureters were kinked and completely obstructed by the traction of ligatures. In two others the ureters were completely obstructed by a pelvic exude following the

application of the Percy cautery, and in two they were caught in vaginal clamps.

In bilateral cases anuria is usually the only symptom referable to the ureteral injury during the early stages of the obstruction but the patient may void urine that was in the bladder prior to the injury. The time at which the symptoms of uræmia appear differs widely but is of no diagnostic importance as the ureteral injury should be recognized long before their development.

The obstructed ureter has little tendency to open without operation, and no instance of bilateral occlusion relieved spontaneously has been found in the literature. Temporary occlusion due to clamping is usually followed by fistula formation.

The choice of operative or other treatment for the relief of bilateral ureteral obstruction will depend upon the cause of the obstruction, the preference of the operator, and possibly, to some extent, the time interval since the receipt of the injury.

The author gives a statistical analysis of the various operative procedures which have been employed and concludes that deligation is the procedure of choice. The objection to deligation based on technical grounds is not well founded. Its advantages are: (1) a lower mortality than nephrostomy (25 per cent as compared with 50 per cent); (2) better final results (complete cure in 75 per cent of the cases as compared with a cure in 20 per cent).

The article contains brief case histories and statistical tables. H. A. Fowler, M.D.

Barney, J. D.: Observations on the Kinks of the Ureter. *J. Urol.*, 1923, ix, 181.

Barney has recently observed five cases presenting symptoms of renal or ureteral calculus in which a definite kink of the ureter was demonstrated by the ureterogram as the cause of the symptoms. Operation in four cases to correct this condition was followed by complete relief both of the ureteral deformity and the associated symptoms. Two early cases are reported in some detail with roentgenograms made before and after operation.

In the second case the ureter showed no abnormality when the catheter was in the kidney, but the ureterogram made when the catheter was pulled well down showed a very tortuous ureter with a marked S-shaped curve at a point opposite the lower pole of the kidney. At operation this angulation was reproduced by injection of the ureter through a catheter previously placed. The deformity could be corrected by lifting the lower pole of the kidney outward. A modified suspension operation was done, using the capsule as a hammock. A ureterogram made subsequently showed the ureter to be normal. This patient has remained free from symptoms.

Barney concludes that these few cases demonstrate beyond any reasonable doubt that kinks or sharp and abnormal curves of the ureter may develop in the male or female on either side and in any portion of the ureter but usually occur in its upper third. Such kinks can be demonstrated only in ureterograms with the catheter lying low down in the ureter; when the catheter is high it acts as a splint and obliterates the kink. These abnormalities are probably caused by two factors, namely, undue mobility of the kidney and lack of support of the ureter as regards lateral motion due to weakness or herniation of its normal sheath.

When the condition has been present for a considerable time (years), hydronephrosis of greater or less degree, often without infection, is to be expected. In the early stages the kink is not fixed in its position and there is no accompanying dilatation of the renal pelvis. The symptoms are identical with those produced by renal or ureteral calculus. It is probable that permanent alterations in the course of the ureter are induced sooner or later by infection. Because of this, and because the continuance of the condition must invariably give rise to hydronephrosis, early operation should be advised.

H. A. Fowler, M.D.

Hunner, G. L.: Conservative Renal Surgery Associated with Ureteral Stricture Work. *J. Urol.*, 1923, ix, 97.

More general recognition of ureteral stricture as one of the most common intra-abdominal or intrapelvic lesions would obviate much unnecessary abdominal and pelvic surgery. Free kidney drainage through the dilatation of ureteral strictures will relieve a number of varied conditions such as migraine and gastro-intestinal disturbances which defy all other methods of treatment.

Large hydronephroses, sometimes even those which are infected, may be cured by simple dilatation of a ureteral stricture and adequate renal drainage. Stricture of the ureter may be present even though a No. 5 or 6 renal catheter reveals no obstruction. Therefore catheters Nos. 7, 8, and 9 should be used. The pyelo-ureterogram also may fail to give the necessary information.

There are three types of cases of hydronephrosis due to ureteral stricture: (1) those showing equal dilatation of the upper ureter and renal pelvis and an apparent angle in the ureter a few centimeters below the kidney; (2) those with an apparently straight ureter which enters the kidney pelvis abruptly near its lower border, where shadowgraph fluids are trapped in the kidney; and (3) those showing a fairly wide dilatation of the ureter above the stricture area and a relatively greater dilatation of the pelvis, the ureter tending to prolapse with the kidney.

Salt solution should be used in the first investigation of the renal pelvis as it will not cause a severe reaction if trapped. Except in the cases of nervous patients who have drunk a large quantity of water, hydronephrosis should be suspected if the urine flows through the catheter in a steady stream. A change of position will sometimes favor drainage. Shadowgraph fluid should be drained off before the patient is returned to bed. Overfilling of the renal pelvis is dangerous. A low functionating hydro-

nephrotic kidney causing disabling pain, and especially an infected kidney of this type, should be extirpated providing the opposite kidney and ureter are normal or will probably become normal after treatment. Resection of the ureter should be avoided because of the associated trauma and interference with the blood supply. Generally it is better to fix the kidney by adhesions stimulated by establishing drainage down to the kidney pelvis than to resort to permanent sutures. LOUIS NEUWELT, M.D.

Herbst, R. H., and Thompson, A.: Acquired Stricture of the Male Ureter. *J. Urol.*, 1923, ix, 91.

This article deals with acquired stricture of the male ureter secondary to infection of the seminal vesicles. The authors consider only that portion of the ureter which is closely associated with the genital tract. Strictures secondary to infection are frequently unrecognized because their symptoms are overshadowed by those caused by the original disease in the prostate or vesicles. In many instances they are found only after the inflammation in the prostate and vesicles has subsided. Such strictures occur in early adult life, when infections of the prostate and seminal vesicles are most common. The offending organisms are usually the gonococcus and the colon bacillus.

The authors use the term "occlusion" rather than "stricture" to describe the changes occurring in the ureteral wall because in many instances the lesion does not progress to the connective-tissue stage. From the pathologic standpoint they find three degrees of obstruction: (1) congestion with œdema associated with very acute prostatitis and seminal vesiculitis; (2) inflammatory obstruction in which there is an inflammation of the ureteral wall which may be present for some time without the production of connective tissue; and (3) fibrous stricture which follows the inflammatory type and for which the chlorides of the urine are largely responsible.

The early symptoms are those of prostatitis or seminal vesiculitis. There is frequent imperative urination with pain at the end of the act. The urine contains pus and blood. Acute retention is rare. Late symptoms are those produced by renal retention, the severity of which depends upon the degree of obstruction. Pain, the most common symptom, varies from a dull ache in the lower pelvis which may radiate along the course of the ureter, to a severe renal colic. The fever may be continuous or intermittent. While blood may be found in the urine as an early sign, it usually does not appear until later when destructive changes have occurred in the kidney. The urine contains pus also in the late stages.

Pain caused by the obstruction in the ureter is frequently attributed to the prostate. The pathologic condition of the ureter may be very advanced before the urinary tract is suspected. The authors are unable to make a diagnosis of stricture with the olive-tip bougie. They find that the "hang" which is considered a diagnostic sign is unreliable, particularly when a long cystoscope must be used as in males. A ureteropyelogram is necessary for a positive diagnosis.

In the authors' experience a valuable diagnostic sign is the absence of peristalsis in the mural portion of the ureter as seen through the cystoscope. This is due to inflammatory thickening and rigidity of the extreme lower end of the ureter and the surrounding bladder wall.

Early relief of the obstruction is necessary in order that the function of the kidneys may be preserved. In the inflammatory type, treatment should be directed to the infected vesicles or prostate. In the indurated type, gradual dilatation with ureteral bougies is indicated. In cases of hard fibrous strictures which do not respond to dilatation and in which the condition is limited to the mural portion of the ureter, incision is necessary. Strictures which extend beyond the mural portion of the ureter and do not respond to dilatation should be excised, the ureter then being re-implanted. Strictures complicated by hydronephrosis or pyelonephrosis require nephrectomy. GILBERT J. THOMAS, M.D.

BLADDER, URETHRA, AND PENIS

Camera, U.: The Treatment of Exstrophy of the Bladder (A proposito del trattamento della extrofia della vesica). *Arch. ital. di chir.*, 1922, vi, 421.

The author's patient, a 5-year-old boy, had typical complete exstrophy of the bladder with diastasis of the symphysis pubis. Both ureteral orifices were visible. As the constantly escaping urine was ammoniacal, it was necessary to keep the child in bed on account of the irritation. This condition favors infection leading to pyelonephritis and death.

Absence of the vesical sphincter in such cases has rendered fruitless all operative attempts at anatomical and functional restoration. Incontinence of urine is the chief factor causing discomfort. All efforts to overcome it are radical. One method of treating incontinence consists in directing the urine into the terminal portion of the bowel in order to utilize the anal sphincter for control. Today, vesico-intestinal direct anastomosis has no advocates.

The isolated ureters or the entire bladder wall with its ureteral openings may be implanted into the intestine. This method has been well tried out. The mortality was 22 per cent in sixty-eight cases treated by Walbaum and Enderlen; 33 per cent in fifty-seven cases treated by Katz; 25 per cent in 110 cases treated by Enderlen; and 29 per cent in Jelinek's cases. The usual cause of death is ascending urinary infection. This may be delayed for as long as three or four years after the operation.

Other radical measures are merely mentioned by the author. Legueu's plastic method is recommended to correct the incontinence and is of low risk. If skin flaps are turned in, the formation of urinary salts favors infection and death.

By dissecting off part of the bladder wall and using the prepuce, a closure may be perfected which will permit the wearing of a urinary receptacle rendering the patient reasonably comfortable. The mortality of this procedure is zero.

As in the author's case the testicles were very high, he turned up a large flap of scrotum to cover the defect and brought the penis through a perforation in the flap. A urinary cup was then used.

KELLOGG SPEED, M.D.

Crenshaw, H. L.: A Review of 153 Cases of Bladder Stone Removed by Lithotrity. *Minnesota Med.*, 1923, vi, 77.

The contra-indications for lithotrity are:

1. A stone so large that the jaws of a lithotrite will not embrace it.

2. A stone so nearly filling a contracted or deformed bladder that the lithotrite jaws cannot be opened.

3. Prostatic hypertrophy, vesical tumor, diverticulum, or complications which would necessitate cystostomy following the removal of the stone. Occasionally a moderate degree of prostatic hypertrophy may be relieved by an irritating stone.

4. The presence of a stone with a nucleus of such a physical character that it cannot readily be freed from the lithotrite. Fragments of catheters, wax, and gum bougies occasionally become the nidus of bladder stones.

5. Cases in which the stone is attached to the wall of the bladder and those in which a previous operation has been performed on the bladder or the adjacent structures.

6. Stones with a sharp foreign body, such as a hairpin or knife blade, as a nucleus, unless the cystoscope shows them to be free in the bladder.

Of 606 cases of vesical calculus examined at the Mayo Clinic a diagnosis of stone was made by means of the roentgen ray in 345 of 449 (76.8 per cent) and by cystoscopic examination in 445 of 450 (98.8 per cent). A positive diagnosis of stone was made by a roentgen-ray or cystoscopic examination or both in 587 cases (96.86 per cent).

With regard to the prevention of recurrence of bladder stone the author makes the following statements:

1. Roentgen-ray and cystoscopic examinations must be made after litholapaxy to be sure that all fragments are removed.

2. Infected kidneys should be treated by pelvic lavage or nephrectomy, if necessary, and focal infections should be removed.

3. Stones in the kidney should be removed.

4. Cystitis should be relieved by lavage and topical applications.

5. Causes of retention such as enlargement of the prostate or stricture must be removed if possible. If they cannot be removed, as is the case in the atonic bladder, the regular removal of residual urine should be practiced.

6. Diverticula retaining urine should be removed.

7. Hygienic and dietetic measures benefiting the general health should be adopted.

The use of caudal anæsthesia greatly increases the scope of litholapaxy. It is essential to remember that the sacral nerves innervate not only the urethra and prostatic area but also the musculature of the bladder. Consequently some type of suction apparatus is necessary to remove the fragments of stone as the paralyzed wall of the bladder is unable to expel them.

Kidd, F.: The Treatment of Epithelial Tumors of the Urinary Bladder. *Chicago M. Rec.*, 1923, xlv, 521.

In this most interesting and voluminous article based on a consideration of 162 cases personally observed and treated, Kidd discusses most minutely the symptoms and the various operative methods employed.

If the case is seen early, diathermy or a well-designed operation may remove all of the local growth. In cases of painless hæmaturia immediate cystoscopy is indicated.

Kidd has come to the conclusion that some bladders have a tendency to develop papillomata which is inherent in the entire epithelial membrane, the neoplasms in such cases being entirely new tumors rather than recurrences.

Seventy of every 100 persons with painless hæmaturia are suffering from a tumor of the bladder or kidney.

Occasionally two other symptoms are met with: (1) "pulled ureter," or pain in one kidney caused by the pulling of the tumor on the ureter or blocking it, and (2) the "corked urethra," indicated by intermittent interruption of the stream of urine when the tumor becomes caught in the entrance of the deep urethra.

Of eighty patients who came early enough for diathermy or partial cystectomy, forty-one, or more than half, are known to be alive and well; one has lived eleven years, and many for seven or eight years. It is probable that fifty-five are alive and well.

With regard to the differential diagnosis between a simple and malignant papilloma the author states that he does not approve of removing portions of bladder growths with an operating cystoscope for microscopic study. The risks and inconveniences in such a course outweigh any possible advantage to be gained. In a number of cases the snipping off of portions of a living tumor within the bladder is sure to result in the implantation of fresh tumors on other portions of the bladder wall. The determination as to whether the growth is malignant or benign must be made on the basis of clinical findings if the best results are to be obtained.

Especial attention is directed to the length of the history, the size and appearance of the tumor, the delicacy and length of the fimbriæ and the pedicle, the appearance of the bladder in the region of the pedicle, the singleness or multiplicity of the tumors, the feel of the base of the bladder through the rectum

or vagina, and finally, in some cases, the reaction of the tumor to diathermy. Some tumors which look malignant react at once to diathermy, while others which appear innocent prove refractory and eventually require an open operation; the latter are always malignant.

Of twenty-one cases traced by the author up to 1922, nineteen show no signs of any recurrence, one, nine years, three, eight years, one, seven years, five, six years, four, five years, and one, four years since treatment. It appears, therefore, that treatment by diathermy gives far more permanent results and is less apt to give rise to recurrences than the old open operation. In two of the twenty-one cases there was a recurrence six years and two years respectively after the treatment; the patients were then subjected to an open operation and in 1922 were alive and well. The remaining seven patients, who were traced for a year or more, remained quite free from recurrence and it is justifiable to assume that they were cured. These patients were considerably older than those usually showing simple papillomata. The oldest, a man of 71, has remained well for five years since treatment. The youngest was 21 years.

If a papilloma is seen to be lying high up on the upper wall of the bladder against its peritoneal surface, care must be taken with regard to the severity of the treatment when the pedicle has been bared and exposed. In such cases it is safer not to use an anæsthetic in order that the patient's feelings may serve as a guide to the severity of the burning or electrocoagulation.

Kidd allows an interval of at least three weeks, and not more than four weeks, between the treatments, giving time for all slough to separate, yet not enough time for a fresh growth to occur. In this he does not agree with Beer who carries out the treatment every seven days. After apparent cure the patient should be urged to report at least once a year for a cystoscopic examination. A tiny early recurrence, too small to cause hæmaturia, can be destroyed with ease at one treatment.

Kidd had a new machine designed which is used with a constant current of either 120 or 240 volts, and gives a minute gradation of current from 0 up to at least 1 ampere or more. The spark gap is of remarkable consistency and can be employed continuously for fifteen minutes at a time without overheating. With this machine it is possible to begin each application of current at a very low amperage and gradually increase it to the maximum, so that a maximum of true "diathermy" heating and consequent coagulation of the deeper parts of the tumor is obtained without charring or gassing on the surface of the tumor.

The author's conclusions are as follows:

1. In cases of papilloma of the bladder of a benign type diathermy as applied through the cystoscope holds out an excellent chance of cure without the risk of opening the bladder. To open the bladder and snip out such tumors should therefore be considered a grave surgical misdemeanor.

2. In cases of papilloma of the bladder of doubtful malignancy it is possible for an expert to obtain a certain number of cures by means of diathermy through the cystoscope. Nevertheless, if diathermy fails to show an adequate destructive reaction in the tumor after three treatments at the most, it should be given up and subtotal cystectomy should be carried out.

3. In cases of malignant papilloma, early papilliferous carcinoma, and even very early ulcerating carcinoma of the bladder, subtotal or partial cystectomy is a decided advance in bladder surgery. It should render the old intravesical operation obsolete except in a few isolated cases. It is an operation of considerable technical difficulty and presents a definite risk to life, but when successful it leads to a higher percentage of true cures than the older type of operation as its principles are based on a firmer pathologic foundation. All cases of partial cystectomy should be followed up at regular intervals by means of cystoscopic examination.

4. Total cystectomy has been rendered almost obsolete by partial cystectomy, diathermy, and radium treatment. It should be reserved for cases of multiple malignant papillomata which defy other treatment and for a few favorable cases of early carcinoma involving both ureteral openings.

5. Ureterostomy presents almost as great risk to life as total cystectomy. When successful, it gives great relief. In a few favorable cases it may be used as a preliminary to total cystectomy.

6. Radium has not yet justified its substitution for surgery, but deserves the closest consideration. In the present state of our knowledge it has already replaced total cystectomy; that is to say, for cases in which cystectomy would have been considered formerly we now prefer to advise radium treatment, combined perhaps with open fulguration and deep roentgen-ray therapy. We should cease to remain content with simply draining or leaving alone so-called inoperable cases. The bladder should be opened and one of two courses pursued, either open diathermy or fulguration combined with the implantation of radium emanation glass tubes followed by deep roentgen-ray therapy and the cystoscopic application of radium and diathermy.

LOUIS GROSS, M.D.

Munger, A. D.: Fulguration in the Treatment of Affections of the Lower Genito-Urinary Tract. *Nebraska State M. J.*, 1923, viii, 62.

The unipolar Oudin current is safest for fulguration because of its limited power of penetration. The Buerger operating cystoscope is the best instrument; in the deep urethra an instrument without a beak should be used. The high-frequency current is a tissue-destroying agent of the desired power which acts through carbonization or electrocoagulation.

If pain is experienced when a large bladder tumor is being treated, the application in that area should be stopped for that sitting; in cases of smaller

tumors, a few seconds of intermittent pain are to be expected. Primary hæmorrhage is rare. The patient should be forewarned that secondary hæmorrhage may occur eight to ten days after the treatment. Colon-bacillus pyuria, which is usually present, is often aggravated by fulguration; for this, acriflavine is valuable. Retention of urine resulting from the action on the ureteral sphincter should be anticipated and, if necessary, drainage by means of a permanent stiff catheter should be established for twenty-four hours. In order to prevent perforation of the bladder, the attack should be made from the periphery of the tumor to its base and the treatment should be stopped when the approach to normal tissue is indicated by pain.

The destruction of benign papillary tumors of the bladder is definite and devoid of danger. As the tumor is still small, one or two treatments are usually sufficient. The patient is not confined to bed and an extensive operation is rendered unnecessary. Malignant tumors do not respond to this treatment, a fact of importance in the differential diagnosis.

Chronic conditions of the deep urethra and vesical neck, such as granulomata, sessile polypoid masses, and true polypi, with concomitant infection of the adjacent structures are amenable to fulguration, and certain cases of prostatic hypertrophy or median lobe enlargement respond to tunneling of the obstruction with the active diathermic electrode, with or without the use of Young's punch.

LOUIS NEUWELT, M.D.

Colston, J. A. C.: An Unusual Case of Traumatic Urethral Stricture. *J. Am. M. Ass.*, 1923, lxxx, 307.

The aim of all operative work on the urethra should be the complete restoration of function with a minimum of scar tissue. Cicatricial contraction along the course of the urethra is very difficult to prevent and the chief cause of disappointing results.

In cases of recent injury of the urethra prompt operative interference should be undertaken to control the spread of extravasation. An attempt should be made to repair the rupture and ample drainage should be provided. The after-care demands constant and painstaking attention if the formation of excessive scar tissue, which often leads to dense strictures, is to be prevented. Infection must be actively combated, and every effort made to establish a normal flow of urine through the urethra and prevent the formation of a persistent perineal fistula.

In cases of long-standing traumatic stricture the urethra will be impermeable. Therefore the operator must be guided in his choice of procedure entirely by the operative findings. The author reports the case of a man who was injured two years previously by a telephone pole which fell upon him. The right ischopubic ramus was broken and the perineum severely injured. At the time of the accident an external urethrotomy was done and the bladder drained by a perineal tube. Two years later an external urethrotomy was done on account of a persistent perineal fistula and complete urinary incontinence. The fistula closed temporarily but the incontinence continued and later the fistula reopened. Examination of this case then showed a broad scar in the perineum with a fistula in the center. Rectal examination revealed marked adhesions and infiltrations about the membranous urethra and the apex of the prostate. A catheter was passed into the bladder with difficulty. The residual urine amounted to 300 c.cm. The X-ray showed a large dilated bladder in which the opaque fluid regurgitated into the posterior and anterior urethra. When the patient stood up the fluid dribbled out of the urethra. Cystoscopic examination showed that the internal sphincter had been torn completely through at the right side.

Two operations were performed, about seven months apart. The convalescence was somewhat stormy but perfect functional results were obtained. The patient left the hospital on the twenty-fourth day after the second operation. All wounds were firmly closed and a good stream of urine was voided at normal intervals. Three months later the patient reported that he was still well and had taken up his former work.

JOHN P. O'NEIL, M.D.

GENITAL ORGANS

Barney, J. D., Haines, E. F., and Shedden, W. M.: Some Results of Prostatectomy. *Chicago M. Rec.*, 1923, xlv, 554.

The authors have undertaken to trace all the cases of obstructing prostate discharged from the Genito-urinary Clinic at the Massachusetts General Hospital. They believe that the results of prostatectomy are too seldom recorded and wish to contribute to the knowledge of what ultimately happens to the prostatectomized patient. Their conclusions are as follows:

1. Persons with an obstructing prostate may live in comparative comfort for several years without operation.

2. Cancer of the prostate, whether operated on or not, may not interfere with the general health and activity for a number of years.

3. While the median perineal operation is frequently followed by extremely satisfactory results, it may, and often does, result otherwise and its outcome is not so dependable as that of the suprapubic operation.

4. Incontinence of urine, more or less complete, may follow the suprapubic operation, but is less frequent after this procedure than after the perineal operation. Unless the incontinence is very definite and well marked, it may be, and often is, mistaken for marked urgency.

5. The urine eventually becomes free from infection in nearly half the cases.

6. Cloudy urine does not always indicate renal infection; the bladder alone may be involved.

7. The suprapubic wound gives rise to hernia in but a very small percentage of cases, almost all of them those of men who are doing hard physical work.

8. The general health of the patient is generally much improved following prostatectomy.

9. The size of the urethra gradually decreases after operation, but in spite of this the urine may be uninfected, there may be no residual urine, and the patient may have no subjective symptoms whatever.

10. The non-proteid nitrogen test shows a decrease in the number of milligrams per 100 c.cm. after prostatectomy, this probably being due to better drainage of the kidneys and improvement in the general condition.

11. On the whole, prostatectomy causes no appreciable change in the sex function.

LOUIS GROSS, M.D.

MISCELLANEOUS

Osborne, E. D., Sutherland, C. G., Scholl, A. J., and Rowntree, L. G.: Roentgenography of the Urinary Tract During the Excretion of Sodium Iodide. *J. Am. M. Ass.*, 1923, lxxx, 368.

After its introduction into the body, sodium iodide, which is opaque to the roentgen rays, is normally excreted in the urine. Under certain conditions, sufficient amounts of iodide may be present in the urinary tract to cast a roentgen shadow. The sodium iodide is given either intravenously or by mouth.

Intravenous administration. The patient is first given 1 gm. of potassium iodide by mouth three times a day for two days, in order to determine whether there is an idiosyncrasy to the drug. If no symptoms of acute iodism occur, the intravenous injection of a 10 per cent solution is begun on the third day. Various dosages have been employed, ranging from 5 to 20 gm. of a 10 per cent solution of chemically pure sodium iodide. In most cases a dose of 10 gm. may be given without causing outward symptoms, provided the solution is injected slowly. When a dose of more than 10 gm. is given, symptoms appear, probably because of osmotic changes resulting from large amounts of the hypertonic salt solution.

Satisfactory roentgenograms of the bladder were secured in practically every case with doses of from 5 to 20 gm. given intravenously. Ten-gram intravenous doses of sodium iodide gave fair roentgenograms of the kidneys and ureters in approximately 50 per cent of the cases. The best roentgenograms of the upper urinary tract were obtained with doses of from 15 to 20 gm.

The time factor is important. The roentgenograms should be taken one-half hour, one hour, and two or three hours after doses of 5, 10, and 20 gm. respectively.

Administration by mouth. The best results by this method were obtained by administering 3 gm. of sodium iodide hourly for three hours and taking the roentgenograms from one to two hours after the last dose.

If the bladder alone is to be studied, the administration of from 3 to 5 gm. of sodium iodide without previous preparation is all that is necessary. The roentgenograms are taken three hours after the ingestion of the drug.

Preliminary control roentgenograms were taken before the administration of the sodium iodide. A medium-focus standard Coolidge tube was used with 60 kilovolts, 50 ma., and an average distance of 67.5 cm. from the target to the plate. The time varied from two to eight seconds according to the thickness of the patient.

Keyser, L. D.: The Mechanism of the Formation of Urinary Calculi. *Ann. Surg.*, 1923, lxxvii, 210.

Urinary calculi result from an abnormal type of crystalline precipitation. Normal urine holds water-insoluble crystalloids in solution because of the presence of protective colloids. The hydrogen-ion concentration also affects solution, but is of secondary importance. Rainey, Ord, and Shattock showed that colloidal matter in solution modifies the morphology of crystalline precipitates, sometimes changing them from a non-coalescent to a coalescent type.

The author's study of stone formation by the feeding of oxamid according to the method of Ebstein and Nicolaier suggested that stone formation may be due to: (1) the excretion of an excessive quantity of crystalline material beyond the power of the urinary colloids to maintain either solution or deposition of isolated single crystals, (2) deficiency in the amount of protective colloid in the urine, or (3) the precipitation of normal colloids or interference with their protective activity by bacterial exudates or foreign colloidal matter present as the result of an abnormal metabolism.

The first mechanism of stone formation is experimentally demonstrated by concentrating calcium oxalate in the urine by repeated subcutaneous injections of normal butyl oxalate and calcium chloride over a period of days. An intense oxaluria is produced, and with increasing increments the morphology of the calcium-oxalate crystals changes from a non-fusing to a fusing spheroidal form and calculus formation takes place, the process being sterile.

The second mechanism, namely, the production of a deficiency of protective colloid in the urine of animals, has thus far been baffling. However, Lichtwitz has precipitated phosphates and oxalates from urine *in vitro* by the extraction of colloidal matter. Schale's experiment in which stones were formed *in vitro* by clotting fibrinogen in the presence of freshly precipitated phosphates, oxalates, and carbonates, is also cited as indicating the significance of colloidal factors in stone formation.

The third mechanism, namely, interference with the normal protective colloids by bacterial exudates or other foreign colloidal matter, has been more

positively demonstrated. Sodium oxalate fed to rabbits produced oxaluria of the octohedron type. Direct infection of the kidneys of animals thus fed by means of attenuated colon bacilli was accompanied by the change of the oxalate crystals to the coalescent spheroidal variety. In several instances fusion of crystals took place with the formation of minute calculi. The author cites the experiments of Rosenow and Meisser in which calculi were produced by implanting streptococci from the urine of patients with active calculus formation into the devitalized teeth of dogs. These results are explained by the assumption that the bacteria have a specific activity and produce an exudate bringing into the urinary stream foreign colloidal matter which so interferes with the normal colloidal balance of the urine that the deposition of fusing crystals takes place, stone formation occurring as the result.

The author reports the case of a patient who had passed multiple oxalate calculi over a period of years and whose urine, when he entered the Mayo Clinic, showed atypical fusing spheroids of calcium oxalate.

Tennant, C. E.: Cystin Calculi, A Complex Surgical Problem: Report of a Case of Multiple Cystin Calculi. *J. Am. M. Ass.*, 1923, lxxx, 305.

Cystin calculi are comparatively rare. Up to 1882 only fifty cases of cystinuria had been reported, and in 1916 Kretschmer found the reports of only 107 cases of cystin stones, including two of his own, those of twin boys.

Watson and Cunningham report one case of cystin calculus in thirty-two cases of cystinuria; Morris, two in seventy-seven; and Thompson, three in 114. That cystinuria is a constitutional problem and the cause of cystin calculi is well known. According to Abderhalden, the metabolism in these cases is always normal. The stones may be multiple and located in several portions of the urinary tract at the same time. Cystinuria tends to be a familial condition; of twenty-two cases compiled by Poland ten occurred in four families.

The author reports the case of a woman, aged 21 years, who was referred to him with a diagnosis of acute appendicitis and a provisional diagnosis of cystinuria. At operation a moderately inflamed appendix was found. In addition to the appendectomy, twelve stones were removed from the right ureter through an intraperitoneal opening. Another unusually large stone was found above the pelvis of the kidney but no further operative work was done at this time. The total weight of the stones removed was 14 gm.

A subsequent X-ray examination revealed one stone in the left kidney and two in the right. Later, both kidneys were operated upon at different times, all stones being removed. The patient made a normal recovery.

JOHN P. O'NEIL, M.D.

SURGERY OF THE EYE AND EAR

EYE

Whitham, L. B.: Pulsating Exophthalmos. *Am. J. Ophth.*, 1923, vi, 81.

Seven cases of pulsating exophthalmos, four traumatic and three spontaneous, are reported. They were observed by Whitman or his colleagues. In four of the cases the internal carotid artery was ligated a month to four months after the appearance of the exophthalmos, pressure to the vessels having been applied in the interim. In one case the external carotid was ligated and a Halsted metal band was applied over the common carotid. The seventh patient died of influenza without having had any operative treatment. In all the cases the distressing symptoms disappeared after the ligation. Vision in three cases was 20/30, in two 20/70, and in one 6/200.

The literature on this subject is well reviewed, especially the Sattler résumé and the monograph of de Schweinitz and Holloway. While many names have been given to this disease, Kelley, de Schweinitz, and Holloway contend that the name "pulsating exophthalmos" should be used only when there is a definite opening between the internal carotid artery and the cavernous sinus. Clinically it is not recognized until some time after the injury. Ergelet reported a case which was diagnosed thirty-one months after the injury.

Proptosis, pulsation, thrill, an objective and subjective bruit, and vertigo are the cardinal symptoms. The vision may be destroyed by optic neuritis and atrophy or may remain perfect.

The treatment of these cases is well reviewed, all methods being mentioned from simple pressure on the carotid to ligation followed by the intra-orbital operation.

In conclusion the author states that ligation of the internal carotid offers the best results in pulsating exophthalmos from a true communication between the internal carotid and the cavernous sinus, but recommends that the collateral circulation be prepared by daily compression weeks prior to the ligation. Ligation of the ophthalmic vein should then be done before other carotid ligations.

VIRGIL WESCOTT, M.D.

Small, W. B.: An Experience with Some Cases of Foreign Body in the Eyeball. *J. Iowa State M. Soc.*, 1923, xiii, 41.

Two cases of injury to the globe by small pieces of steel are reported by Small. In each case the first roentgenogram was negative although opthalmoscopic examination revealed the foreign body in the fundus. Second roentgenograms in each case also showed the foreign body. Removal of the steel was followed by detachment of the retina and loss of vision. Attention is called to the fact that ophthalmoscopic and roentgenographic examinations should be combined to determine the presence of small foreign bodies in the eye. VIRGIL WESCOTT, M.D.

Chamberlin, W. B.: The Endonasal Operation on the Lachrymal Sac. *J. Indiana State M. Ass.*, 1923, xvi, 42.

Since 1917, when the author reported eight cases of endonasal operations on the lachrymal sac with one failure, he has operated upon ten cases with no failure as far as the restoration of physiological function is concerned, though not all were freed of pus. Secondary operations were performed on three cases.

The technique employed was that of West with slight modifications.

After preliminary cocainization and infiltration with ½ per cent novocaine containing 2 m. of adrenalin to the dram, a three-sided incision is made. The first two incisions are parallel with the floor of the nose and extend as far as possible from two points, the upper from the point of attachment of the middle turbinal and the lower from a point opposite the free border of the middle turbinal. For these incisions the right-angled knife of Freer is exceedingly well adapted. The anterior ends of the incisions are joined by a vertical incision made as far forward as possible and carried well down to the bone. The flap formed is elevated submucously, the periosteum being of course included, and is deflected backward as on a hinge, between the middle turbinal and the septum, and held out of the field during the remainder of the operation by a small pledget of cotton.

The posterior lip of the dense ascending process of the superior maxilla is then attacked with a chisel and gouge until the nasal wall of the sac is exposed. This is easily recognized by palpation with a probe. Sufficient bone is removed to uncover the sac freely in almost its entire nasal aspect. At this point a probe is inserted into the sac through the canaliculus, pushing its nasal surface, tent-like, well over toward the septum. A thin scalpel is then inserted between the probe and the lateral nasal wall, the outer or free end of the probe being held by an assistant or fastened to the forehead by a strip of adhesive plaster. In this way it is possible to resect a larger portion of the sac. Loose pieces are removed subsequently by means of the smallest forceps of Gruenwald. West's dictum that at the completion of the operation the probe introduced through the canaliculus into the sac must pass horizontally into the nose is strictly adhered to. When the submucous flap is replaced, its upper half covering the sac is

resected and the lower portion held in position for twenty-four hours by light packing. Subsequently the nose is kept free from crusts until healing takes place. If desired, the sac is irrigated through the canaliculus. O. M. Rott, M.D.

Allport, F.: Industrial Eye Injuries. *Illinois M. J.*, 1923, xliii, 145.

Allport discusses the prevention of industrial eye injuries.

Applicants for positions should be given a thorough ocular examination before they are employed. Both central and peripheral vision should be tested and an examination made for slight strabismus, minute irregularities, opacities, evidences of previous disease in the media and fundus, and refractive errors. Permanent records of the findings of such examinations should be kept in case they may be needed as evidence in lawsuits to obtain financial remuneration from the corporation for physical injury. Trachoma and other contagious diseases of the eye may be detected and epidemics warded off by such examination. In addition, it will bring an abnormal eye condition to the employee's attention so that he may obtain proper treatment.

The author discusses in detail the proper lighting of shops. The cost of such lighting he gives as approximately ¼ of 1 per cent of a man's wages.

Most shops have come to realize that goggles are essential. A glass can be placed in goggles to correct a refractive error.

Proper tools and proper protective devices on machines will reduce the number of eye accidents. Most hammering accidents are caused by using tools with burred or mushroomed edges. Dust particles should be removed from machines and from rooms by an exhaust system. Where molten metals are being poured the goggles should be supplemented by leather masks to protect the face and head. Properly tinted glass should be used by persons working in exceedingly bright light such as that due to electric welding and blast furnaces. This will protect the retina from serious injury.

The so-called "shop oculist" is one of the greatest menaces to eyesight as he attempts to remove foreign bodies from lids and corneæ with dirty hands and poor illumination and instrument.

The vapors in certain industries should be very carefully removed or diluted as their inhalation frequently causes blindness. These include the vapors of di-nitro benzine used in the manufacture of anilin dyes, bi-sulphide of carbon used in vulcanizing rubber, the nicotine in tobacco factories, arsenic, lead, carbon monoxide, and wood alcohol.

In conclusion the author states that office employees should be given refraction tests by a competent oculist. T. D. Allen, M.D.

Landolt, E.: A Study on Strabismus. *Am. J. Ophth.*, 1923, vi, 93.

Landolt attacks the question of strabismus from the standpoint of the central nervous system. He points out that the innervation of convergence is analogous to the innervation of accommodation, both eyes receiving the same nervous impulse. It is not sufficient for the images to be simultaneously formed at the fovea of both eyes (convergence); they must also be well defined (accommodation). The degree of convergence and accommodation is inversely proportional to the distance of the object from the eyes. In hyperopia the same degree of convergence must be accompanied by a greater amount of accommodation corresponding to the degree of hypermetropia.

The author objects to the statement that a person "squints with the left eye" and to the phrase "a left convergent strabismus." He believes it would be better to say, "The patient has a concomitant convergent strabismus and uses his right eye for fixation." This statement would be in agreement with the etiology of strabismus. He regards amblyopia as the cause rather than the effect of the squint, and cites the fact that cataractous eyes do not become amblyopic but have good vision as soon as the cataract is removed. A result of long-standing convergent strabismus is limitation of lateral motion, especially in the eye which deviates. This is another effect of strabismus.

After proper lenses have been prescribed, the accommodation has been paralyzed, and stereoscopic exercises have been outlined it may be necessary to operate.

For the surgical treatment of convergent, divergent, vertical, and paralytic strabismus and for convergent insufficiency the author recommends advancement and condemns tenotomy.

Virgil Wescott, M.D.

Pickard, R.: A Method of Recording Disc Alterations and a Study of the Growth of Normal and Abnormal Disc Cups. *Brit. J. Ophth.*, 1923, vii, 81.

From a study of a series of curves and frequency polygons reported in a previous article Pickard concluded that the enlargement of the cup in adult life without symptoms of glaucoma must be considered an effect of pressure, and that such cases require careful watching for the development of glaucoma. In this article he outlines his method of drawing and recording the disc and the cup. Having drawn them, he superposes a transparent celluloid plate marked off into 1/10 in. squares. Then, by measuring the size of the disc and cup, he calculates the percentage of the area of the entire disc occupied by the cup.

In normal cases the enlargement is toward the temporal side. In primary optic atrophy there is cupping. In chronic glaucoma the enlargement of the cup is in all directions, remains conical, and reaches the temporal border first. Cases of glaucoma in which there is a small cup are more painful. The drawing of the disc and cup as a part of the routine record of eye cases is strongly recommended.

Virgil Wescott, M.D.

EAR

Smith, S. M.: Acute Aural Diseases in Children. *Therap. Gaz.*, 1913, 3 s. xxxix, 77.

The author urges the careful examination of the ear before an earache is pronounced unimportant and also as a routine procedure in cases of pneumonia, influenza, typhoid, and the exanthemata, especially when there is an apparent relapse, because frequently a relapse is caused by inflammation in the middle ear.

Attention is directed to the dangers of neglect of the catarrhal variety, leading to interference with the hearing function, and of neglect of the suppurative variety, leaving such complications as intracranial infections.

The importance of early incision of the drum and, when this does not suffice, early mastoid operation is emphasized. O. M. Rott, M.D.

Esser, J. F. S., and Aufricht, G.: The Operative Correction of Ear Defects by Epithelial Inlays (Operativer Ersatz der Ohrdefekte durch "Epitheleinlage"). *Arch. f. klin. Chir.*, 1922, cxx, 518.

In cases of complete absence of the lobule of the ear a flap which is larger by one-third than the desired lobule and 0.5 to 0.75 cm. thick is cut from the skin of the neck below the ear, and a piece of softened Stent's mass, the size of a hazelnut, is applied between the skin flap and the secondary wound site to obtain an impression of the wound surface. The Stent's impression is then wrapped in a Thiersch flap in such a way that the wound surface is on the outside and the center of the Thiersch flap occupies that point of the impression which will be deepest in the wound cavity. The mass with its covering of epidermis is then fitted into the wound cavity and the edges of the graft are sutured to those of the wound. The Stent's mass is removed after two or three weeks when the Thiersch flap has become healed in. In this way, the posterior surface of the new ear lobule and the secondary defect are covered with epidermis. Subsequently only slight cosmetic corrections are necessary.

In the correction of defects of the auricle a cartilage framework from the sixth and seventh costal cartilages is used. This is suitably shaped immediately after its excision so that it will not be injured subsequently, and is then placed in a prepared canal under the skin behind the ear. After three to four weeks, when the cartilage has healed in, the skin flap with bone and cranial periosteum is undermined through a curved incision at the hair-line. The Thiersch flap heals to the bone which has been freed from periosteum. In the restoration of the ear lobule in the manner described, an impression with Stent's mass is taken of the newly formed wound cavity. In this way the secondary defect and both surfaces of the new portion of the ear are covered with epithelium. The suitably large flap above and below is then mobilized by incision and, after freshening of the wound, is sutured into the defect of the ear so that the corresponding portions of the helix and antihelix are united with the proper parts of the auricle.

The entire auricle is also reconstructed with cartilage from the sixth and seventh costal cartilages. The epithelial inlay under the cartilage-skin flaps is supplied with thick Stent's masses as if projecting ears were to be made. This is important, as the shrunken epithelium draws the new ear backward. If there is doubt as to the nutrition of the flap, the flap may be dissected free gradually with smaller epithelial inlays at intervals of three or four weeks. The procedure is shown in illustrations.

Haumann (Z).

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Natanson, L. N., and Lipskeroff, I. B.: Perforation of the Nasal Septum in Cocaine Sniffers (Ueber die Perforation des Septum nasi bei "Cocainschnupfern"). *Medizinski J.*, 1921, i, 463.

Among eighty-six cocaine sniffers, most of whom were prostitutes, the authors found only three who did not have nasal changes due to the cocaine. In seventy-eight they found a perforated septum, in two, an ulcer of the septum, and in three, healed ulcers. From a careful investigation of sixty-two cases the following facts were learned:

1. The presence of the perforation was unknown to the patient.

2. In all cases the perforation involved the cartilaginous portion of the septum. There were no other changes. The small perforations were round, the larger ones oval. The edges were undermined. The lumen of the perforation was frequently occluded by an odorless crust.

3. The sense of smell was preserved, but at times diminished.

4. In four cases there was sinking of the nasal cartilage.

5. The palate, nasopharynx, and larynx presented no changes.

6. Perforations were found even when the drug had been used only a few weeks.

7. The ages of the sniffers ranged from 14 to 30 years.

8. The dose was 1, 5, or 10 gr. of cocaine daily, sometimes even more. The sniffing was indulged in for from two months to nine years. The average length of time was between two and three years.

9. Of the sixty-two sniffers twenty-five had latent syphilis, five were in the primary or secondary stage, and one had tertiary syphilis. The rest were not syphilitic.

The authors do not believe that syphilis was the cause of the perforation. Histologic examination of the peripheral portions of the perforations presented showed destruction of the hyaline cartilage, degenerative changes in the connective tissue, slight lymphoid infiltration of the submucosa, pronounced anæmia, and narrowing of the blood vessels.

The authors' conclusions are summarized as follows:

1. In cocaine sniffers, ulceration of the septum develops first and then perforation.

2. The cocaine perforation is localized in the cartilaginous portion of the septum and resembles the perforating ulcer of the septum. When the perforation is large, collapse of the nasal cartilage occurs.

3. Only exceptionally is the use of cocaine harmless.

4. In the diagnosis of a perforation of the cartilaginous portion of the septum the possibility that it may be a cocaine perforation should be borne in mind.

5. Cocaine perforations of the septum nasi should be given a prominent place in textbooks on rhinology.

LUTHER (Z).

Bakker, C., and Oudendal, A. J. F.: A Rare Chondroma of the Nose (Ein seltenes Chondrom der Nase). *Ztschr. f. Laryngol., Rhinol., etc.*, 1922, xi, 97.

The case reported was that of a Javanese woman in whom, in the course of two years, a tumor of the nasal septum developed and disarranged the entire anterior portion of the nose. This growth measured 50 by 35 by 28 mm. Within it was a necrotic cavity measuring 6 by 13 by 4 mm. The diagnosis was ecchondroma of the nasal septum.

Histologically, the tumor appeared to be divided into numerous small islets of cartilage separated by connective tissue. The basic substance was pure hyaline cartilage. Nowhere were there any signs of calcification, ossification, or vascularization. In the necrotic foci the connective tissue was partially maintained but showed signs of fresh and old hæmorrhages. Signs of chronic inflammation were noted at different points in the connective tissue of the tumor.

RUNGE (Z).

Dunham, K., and Skaviem, J. H.: Sinus Disease and Lung Infections. *J. Radiol.*, 1923, iv, 37.

Of 389 patients referred by able clinicians as tuberculous the authors found 28 per cent to be suffering from some other infection, and among these non-tuberculous cases the primary focus outside the lungs was as a rule in the head. This observation has been so constant that in every case presenting a non-tuberculous lung lesion the authors examine the air sinuses and tonsils.

Sinus disease may be present with absolutely no symptoms referable to the head of which the patient is aware. Of the 389 patients studied, all presented physical signs over the chest. The differential chest diagnosis was made on the basis of stereoscopic X-ray plates of the chest. When no evidence of active pulmonary tuberculosis was found the active focus was sought by most careful and complete physical and X-ray examinations.

In cases showing definite symptoms and signs pointing to lung infection, differentiation is almost always a task calling for every clinical and laboratory test available. Chief and foremost is the X-ray picture of the chest. The reading of an X-ray chest plate should be done by a specialist.

The normal lymph flow through the lung, which occurs from the parenchyma toward the hilum, except for a small area immediately under the pleura

which may drain into the pleural lymphatics, has a vital bearing on the pathology and progress of the disease. Of prime importance in the reading of an X-ray chest plate, however, is a thorough understanding of the septa of the lung and their influence on the pathology. When an adult possesses the ordinary amount of resistance, the lesions of pulmonary tuberculosis tend to become healed. The lesions of an adult type of pulmonary tuberculosis are the result of repeated infections from without or within. Densities caused by the pathologic changes of pulmonary tuberculosis and shown on the plate vary in their quality and degree, progressing from the least dense to the heaviest, as follows: (1) serous exudate, (2) cellular exudate, (3) fibrosis, (4) caseation, (5) calcification. A thorough study of chest plates with this understanding will enable one to read the changes in terms of the actual pathology. Given an acute infection or infarct, the resultant densities shown on the X-ray plate will all be of the same quality because all of the lesions will be in the same pathologic state.

The lung lesions secondary to a chronic sinus infection may be characterized as areas of exudate in the lung. Lesions located in the apices will produce a perfect clinical picture of incipient pulmonary tuberculosis with fever, cough, expectoration, malaise, loss of weight, blood spitting, and localized râles over the apices. The X-ray picture may show definite localized densities, but when two or more densities are present they are of the same quality.

The presence of a non-tuberculous lesion in the lungs having been determined, proper handling of the case will then demand an X-ray examination of the sinuses and the close co-operation of a competent nose and throat specialist. Malignant tumors of the lungs, such as carcinoma or sarcoma, spread by continuity with no respect for septa. In the majority of cases the X-ray plate shows ball-like lesions.

The authors' conclusions are as follows:

1. The first step in the differential diagnosis of lung diseases is to determine whether the lesion is tuberculous or non-tuberculous.

2. In any case of apical catarrh, purulent bronchitis, bronchiectasis, or localized areas of pneumonia, a search should be made for infection in the head or throat.

3. The symptoms of incipient pulmonary tuberculosis are the symptoms of a local infection.

4. A properly interpreted X-ray plate of the chest is the most valuable aid in the differential diagnosis of tuberculous lung lesions and acute infections secondary to sinus disease. DAVID R. BOWEN, M.D.

Dahmann, H.: Osteoma of the Accessory Nasal Sinuses: Two New Contributions and a Critical Collective Review (Ueber das Osteom der Nasennebenhöhlen: Zwei neue Beiträge und kritisches Sammelreferat). *Ztschr. f. Hals-, Nasen-, u. Ohrenheilk.*, 1922, i, 284.

The author reviews thirty-six cases of osteoma of the nasal accessory sinuses which have been reported during the last ten years. Two of his own cases are described in detail.

Dahmann's first case was a previously diagnosed very large osteoma. Removal of the tumor resulted in a cure in spite of severe injury of the dura with the escape of cerebrospinal fluid. As the frontal sinus was normal and the nasal cavity was not opened, there was no infection of the meninges.

In the second case the removal of a very small osteoma in the vicinity of the lamina cribrosa in a previously healthy person led to meningitis and death because there was a wide communication between the wound and the nasal cavity and the meninges were infected by way of the diseased frontal sinus.

In conclusion the author gives a detailed description of the pathogenesis, symptoms, and treatment of osteomata. BRUEGGEMANN (Z).

Meyer, M.: Carcinoma of the Ethmoid Bone: With New Contributions on Ossification in Tumors (Ueber das Carcinom des Siebbeins: Mit neuen Beitragen zur Knochenbildung in den Geschwülsten). *Ztschr. f. Hals-, Nasen-, u. Ohrenheilk.*, 1922, i, 285.

Among five carcinomata of the ethmoid bone observed during the last year there were three adenocarcinomata, one carcinoma commune, and one pavement-cell carcinoma. The characteristic rhinoscopic picture is the displacement of the septum toward the normal side by a bluish to grayish-red tumor which is superficially ulcerated. Occasionally, if the tumor originates from the posterior ethmoid cells, it is demonstrable also by posterior rhinoscopy. The symptoms—headache, hæmorrhage, ocular disturbances, and swelling of the external nose—vary in different cases, and fluoroscopic and roentgenographic examinations do not always give the same findings. Biopsy is very important in the diagnosis; therapeutically, a radical operation and subsequent irradiation are advisable, but recurrence is the rule.

The second portion of this article is concerned with interesting anatomical observations on the development of bone by osteoblasts in preformed bones, the neoplastic and metaplastic development of bone in the supporting tissue, the new formation of bone from connective-tissue cartilage, and the development of cartilage from gelatinous tissue. SCHLITTLER (Z).

Schlittler, E.: How May the So-Called "Serious Accidents" in the Irrigation of the Antrum of Highmore Be Avoided? (Wie lassen sich die sog. "schlimmen Zufälle" bei der Kieferhöhlenspülung vermeiden?). *Ztschr. f. Hals-, Nasen-, u. Ohrenheilk.*, 1922, i, 371.

The author disapproves of the use of sharp needle- or trocar-shaped instruments for the puncture of the antrum of Highmore, recommending instead the dull Siebenmann cannula with which the puncture is undertaken by way of the middle nasal meatus. He draws the following conclusions:

1. Most of the serious complications occurring in the course of puncture or irrigation of the antrum of Highmore can be traced to the occurrence of air embolism.

2. A smaller number of these are reflex processes set up by the operative trauma in the medulla oblongata, the sympathetic-vagus system, and the cerebrum, causing symptoms in the respiratory and circulatory systems similar to those occasionally observed in other operative procedures in the interior of the nose in which air embolism can take no part, and those occurring occasionally as signs of cocaine poisoning.

3. In all of the definitely proved cases of air embolism up to the present time a sharp instrument was used for the puncture or irrigation of the antrum of Highmore. In regard to the origin of the air embolism in the autopsy material available, it must be assumed that the point of the instrument piercing the mucosa of the lateral nasal wall or the antrum of Highmore punctured a vein, direct inflation of air resulting.

4. The decisive factor in the development of the air embolism is the manner in which the puncture of the antrum of Highmore is done.

5. The use of dull, flexible cannulæ almost completely prevents perforation of the mucosa of the antrum of Highmore; no case of air embolism after puncture or irrigation with a dull cannula has yet been reported.

6. The puncture of the antrum of Highmore with the Siebenmann cannula through the fontanelles, through the membranous part of the middle nasal meatus, or through an accessory opening is no more difficult technically than other procedures.

BRUEGGEMANN (Z).

THROAT

Trinder, J. H.: X-Ray Treatment of Tonsillar and Lymphoid Tissue. *Ann. Otol., Rhinol. and Laryngol.*, 1922, xxxi, 1044.

Both lymphatic and embryonic tissues are more easily destroyed by the X-ray than any other living cells. The tonsil is made up largely of lymph tissue and the small fibrous tonsil commonly associated with rheumatism contains lymph follicles, of which 90 per cent are embryonic tissue and the remainder engorged with mature lymphocytes. Very small doses of X-ray may be used to promote absorption of the lymphatic element, and will in no way interfere with any of the surrounding and adjacent cells or glands. From the standpoint of infection, the shrinkage of the tonsil and the lymph tissue of the lateral and posterior walls of the nasopharynx by the X-ray will relieve the distortion of the crypts throughout the entire mucous membrane and thus promote drainage. This is impossible by any other method. The technique requires a 5-in. spark gap, a current of 5 ma., a 2-mm. aluminum filter, an 8-in. skin distance, and three minutes' exposure to each tonsil. From five to ten treatments are given at intervals of one week. The treatments are repeated in all cases until members of the hæmolytic group or the pneumococcus group, or other pathogenic organisms found present, disappear. A minimum of five treatments is given if no virulent bacteria are discovered.

Thirteen cases of tonsils examined before and after X-ray treatment showed no increase of fibrosis, but some vacuolation of the cells of the mucosa with apparent widening of the crypts. There was no reduction in the size of the lymph follicles, but in a few cases there appeared to be a thinning out of the number of cells. There was no apparent reduction in the amount of lymphoid tissue.

In observing the cases over a period of six months the author noted a marked reduction in size in the greatly hypertrophied tonsils following X-ray therapy. The tonsils removed after a course of roentgen-ray treatment showed marked retraction behind the pillars rather than a decrease in size. The organs were more densely adherent after treatment.

In the author's opinion, X-ray therapy is a valuable adjunct to present-day methods of treating diseases of the throat, but its use is limited as the tonsil is apt to become infected after it has been rendered sterile by means of the X-ray. The operation of tonsillectomy remains the method of choice when it can be used advantageously. In the cases of neurotic persons, poor operative risks, and persons who refuse any operative procedure, roentgen-ray therapy is of decided value.

JAMES C. BRASWELL, M.D.

Boyd, E.: Observations on Some Throat Conditions in Children. *Med. Press*, 1923, n. s. cxv, 150.

The author discusses: (1) the influence of the contraction of the palatoglossus muscle in the formation of the pendulous and buried types of tonsils, (2) snoring, (3) the influence of defective nasal breathing in the production of deformities of the bones of the face, and (4) affections of the tonsils in infancy.

Boyd believes that the shape of the tonsil depends upon the strength of the contraction of the palatoglossus muscle. The stronger the muscle the more protruding or buried the tonsil. Tonsils of the pendulous type are more easily removed with the patient gagging, but the removal of the buried type demands relaxation.

Snoring is explained by the assumption that the tongue is relaxed and, with the epiglottis falling backward, partially shuts off the air-way. When the negative pressure in the thorax is sufficient to draw the air through the narrowed opening, the air is set in vibration.

The defective growth of the bones of the face is more of a biological problem than the result of nasal obstruction. Factors of importance are the condition of the general health and nutrition in early life and the proper development of both the primary and the secondary teeth.

In the author's opinion acute and chronic conditions of the tonsils may occur in infancy and the tonsils should be removed, when diseased, irrespective of the age of the child. The physician in charge should always be consulted. O. M. Rott, M.D.

Babcock, J. W.: Observation on the Results of Roentgen Therapy in Chronic Tonsillitis. *J. Am. M. Ass.*, 1925, lxxv, 300.

Babcock reports his observations on the results of roentgen therapy in nine cases of chronic tonsillitis to show the futility of depending upon this method in dealing with chronic infected tonsils. He found that roentgen therapy as now advocated may cause more or less diminution in the size of tonsils or other lymphoid tissue in the pharynx or nasopharynx, but that the residue may be acutely inflamed and much increased in size during the inflammation. Moreover, it has been demonstrated that the small fibrous tonsil is equally apt to serve as a focus of infection with remote symptoms.

The findings in excised tonsils indicate that they are not made free of pathogenic bacteria; that there is no evident increase in connective tissue, diminution of lymphoid tissue, lack of activity of the germinal centers, or widening of the crypts. Neither the adenoids nor the hypertrophic lymph nodules on the posterior wall of the pharynx disappear or change in any appreciable way; and they are subject to occasional inflammations similar to those preceding roentgen therapy. General symptoms, involving the heart and joints, have not been relieved in these cases by roentgen therapy, but in several of them have improved following an operation performed some time after the roentgen treatment.

In conclusion the author states that until it is more definitely shown that diseased tonsils and other lymphoid tissue in the pharynx and nasopharynx can be eradicated as efficiently by a less unpleasant process, reliance must be placed on surgery.

O. M. Rott, M.D.

Kuhn, C. F.: Tonsillectomy and Its Complications. *Am. J. Surg.*, 1923, xxxvii, 22.

The author stresses the importance of a careful pre-operative examination of the patient in order to discover conditions which, unrecognized, might give rise to severe or even fatal complications following or during the removal of the tonsils. Several case reports are given to illustrate this point. The following complications are mentioned: hæmorrhage, the lodging of a food bolus in the pharynx, status lymphaticus, feeble heart, coincident suppurative appendicitis, lung abscess, tuberculosis, syphilis, lymphosarcoma of the cervical glands, suppuration of the accessory sinuses, and neurasthenia.

In order to discover the presence of such complications the patient should be taken to the hospital the day previous to the operation and complete physical and laboratory examinations should be made in addition to careful recording of the history.

O. M. Rott, M.D.

Figi, F. A.: Cysts of the Bursa Pharyngea. *Laryngoscope*, 1923, xxxiii, 37.

The bursa pharyngea is a small median pouch or recess connected with the pharyngeal tonsil on the upper posterior wall of the nasopharynx. Its nature is still indefinite but has been variously stated to be: (1) the remains of Rathke's pouch, (2) a crypt developed in connection with the pharyngeal tonsil, (3) an independent outgrowth of the mucous membrane. The first of these is ruled out by Fraser's work demonstrating that Rathke's point is along the back of the nasal septum, a situation entirely too far forward for the development of a cyst in this region.

Cysts of the pharyngeal bursa were first observed in the cadaver by Luschka in 1868. Tornwaldt, in 1885, attempted to show a definite relation between these cysts and nasopharyngeal catarrh, so-called Tornwaldt's disease. These cysts rarely become large enough for clinical recognition. They vary in size from a few millimeters to about 2 cm. in diameter and may occur at any age. In the nasopharyngeal mirror they appear as glistening hemispherical bluish-gray or slightly yellowish masses having broad attachments to the midline of the upper posterior wall and the vault of the nasopharynx. They are either unilocular or multilocular, have a thin limiting membrane, are slightly fluctuant, and contain thick viscid mucus or mucopus. The posterior wall is formed by the mucous membrane over the basilar process of the occipital bone, which is excavated according to the curve of the cyst wall. As a rule such tumors do not cause symptoms unless there is an associated inflammatory condition or they are large enough to cause obstruction. It should not be difficult to make a diagnosis as the location and appearance of the cyst are characteristic. Clinically, they are significant as a rule only from a diagnostic standpoint, many of the cases having been found accidentally during the course of routine nasopharyngeal or detailed postmortem examinations. Two cases are reported, one that of a man aged 37 years, the other that of a man of 52. In both instances the cyst was discovered during the course of a routine nasopharyngeal examination, no symptoms referable to the tumor being present.

Berry, G.: War Surgery of the Larynx, with Special Reference to the Work at Cape May. *Laryngoscope*, 1923, xxxiii, 85.

The principal symptoms of war injuries of the larynx are aphonia, hæmoptysis, dyspnœa, external hæmorrhage, dysphagia, emphysema, difficulty in moving the neck, and injury of the nearby nerves. The more frequent complications are bronchitis, pneumonia, septicæmia, mediastinitis, and gas infection.

The treatment depends upon the nature of the lesion. Palliative treatment consists of rest and the use of sedatives, steam inhalations, and allied medication. Many cases are cured by these procedures.

The first essential is to prevent choking. If palliative measures do not serve, a tracheotomy becomes imperative. If the case is under close observation in a hospital, tracheotomy may be delayed, but if the patient must be transported it should be performed at once. The majority of surgeons prefer to perform a high tracheotomy first and a low one later if the cannula remains in for a long period of time.

Extralaryngeal bleeding is controlled by the usual surgical procedures. Intralaryngeal bleeding usually stops spontaneously.

The emphysema takes care of itself after free breathing has been restored and the wound has been opened up. Dysphagia due to traumatic swelling disappears as the œdema goes down. If the œsophagus has been cut, the edges should be sutured and the patient fed for a while through a tube or by rectum.

The indirect laryngeal picture should be studied as early as possible in order that tears of the mucous membrane, œdematous stenoses, and early paralysis may be determined and recorded against later changes.

Of twelve cases treated at Cape May, a high tracheotomy was done in six, and in three of the latter a low tracheotomy was done later. In two, the tube was removed after three weeks, and in one, after one year. In another it will be removed soon, but in the fifth must be left in place for some time longer. The sixth patient has not been heard from for over a year.

In four cases a chronic laryngeal stenosis developed and required protracted operative treatment.

The vocal results may be classified as follows: whisper voice, four; weak, hoarse voice, five; strong, hoarse voice, three. There were no fatalities in the series.

In the author's opinion, infection plays a very important part in the acute cases, but in chronic stenoses the presence of the tracheotomy tube is of greater importance. When a high tracheotomy is done, a space through which no air passes is established between the tube below and the cords above. The organism tends to fill up such dead space, the resulting stenosis being not so much a scar contraction as a new tissue formation built in from the cartilaginous wall. In order to defeat this tissue infiltration the caliber of the breathing tube should be diminished so that more air can pass around the tube to exert positive pressure.

JAMES C. BRASWELL, M.D.

Jurasz, A.: Subcutaneous Avulsion with Oblique Torsion of the Larynx After Burial (Subcutaner Abriss mit schraeger Torsion des Kehlkopfes nach Verschuettung). *Ztschr. f. Laryngol., Rhinol.*, 1922, vi, 117.

In 1916, a soldier 24 years old was buried in such a way that he was covered by earth up to his mouth while in the standing position. His head was turned and bent to the left, his neck was squeezed, and respiration was possible only with the greatest difficulty. The author saw the patient for the first time four years after the injury. Respiration was then difficult only on rapid walking, on bending down, and when the head was turned. Externally, absence of the muscular pad on the right side of the neck and of a connection in the center between the hyoid bone and the edge of the thyroid cartilage was found. Over the sternum was a protrusion as large as an apple, which proved to be the larynx. On laryngoscopic examination the entire left half of the larynx appeared shortened, but the right half was very clearly visible. The author explains this condition as follows:

During the burial the right side of the neck was under considerable pressure from the masses of earth lying upon it. The right sternocleidomastoid muscle was stretched and ruptured with the formation of a hæmatoma. In the larynx, stretching of the hypothyroid region and torsion and squeezing were produced. With developing stenosis of the larynx, an attempt is made to overcome the obstruction to respiration in a reflex manner by drawing the larynx upward and downward (Gerhardt's symptom). The result of this attempt in this case was the avulsion of the thyrohyoid muscles and the upper cords of the thyroid cartilage, and the sinking of the larynx in its position of torsion down to the sternum. The hindrance to swallowing was shown roentgenologically to have been caused by the pressure of the displaced larynx on the œsophagus.

HUENERS (Z.)

MOUTH

Darling, B. C.: Can the Medical and Dental Professions Agree on Any Standardized Treatment of the Focus of Infection? *J. Radiol.*, 1923, iv, 59.

The material presented in this paper has been compiled from about fifty-five replies to a questionnaire sent out to 200 dentists in various parts of the country. These men are all well known in the profession and their replies may be considered as representative of what dentists are doing today with the problems presented by oral foci of infection in the form of peri-apical and pyorrhœal conditions.

The following questions were asked.

1a. What is your present opinion as to extraction in the case of a tooth that shows definite peri-apical pericemental destruction?

1b. What is your present opinion as to extraction in the case of a tooth that shows definite peri-apical rarefaction or chronic abscess?

2a. If you believe in root-canal treatment of these teeth what method do you recommend?

2b. What X-ray appearance will differentiate those favorable for root-canal therapy from those to be extracted?

2c. What important clinical symptom or guide, other than the X-ray appearance, will enable you to tell which teeth will go on to repair and bone restoration and which are a possible source of infection?

1. Do you believe that where teeth show bone restoration more or less complete in two or three years this indicates that the teeth are no longer a possible source of infection? Why?

4a. Is there any working basis in your locality? If so, what is it?

4b. Does each dentist work it out for himself on the basis of root-canal treatment, if possible withholding extraction?

5. How would you define or standardize the dental attitude in this matter so that the dental and medical professions can understand each other?

6. In pyorrhœa what amount of alveolar destruction indicates extraction?

7a. Is it sounder for the diagnostic survey for the average dentist to consult with a medical or dental roentgenologist or to do all his own X-ray work and interpretation?

7b. Will the public as well as the professions be benefited by sharing of the responsibility by consultation?

The following is a summary of the replies.

1a. Fifty-six per cent extract, 10 per cent treat first; 34 per cent save.

1b. Forty-eight per cent extract, 40 per cent treat first; 12 per cent save.

2a. There is too great a divergence of methods for classification.

2b. Seventy-six per cent use the X-ray for differential diagnosis; 24 per cent do not depend on the X-ray.

2c. Seventy-three per cent use clinical symptoms; 27 per cent do not depend on clinical symptoms.

3. Thirty-eight per cent believe infection remains after bone restoration; 13 per cent are undecided; 49 per cent believe infection is cured.

4a. There is no agreed working basis.

4b. Fifty-four per cent of the dentists work out each case for themselves; 13 per cent have a slight tendency to an agreed practice; 33 per cent are uncertain.

5. The majority believe it is impossible to standardize the dental attitude at the present time.

6. There is no definite standard as to what amount of alveolar destruction indicates extraction.

7a. Forty-two per cent believe the dentist should do his own X-ray work; 58 per cent favor consultation with a roentgenologist.

7b. Twenty-four per cent are unwilling to consult with members of the medical profession; 76 per cent are willing to consult. S. J. Seeger, M.D.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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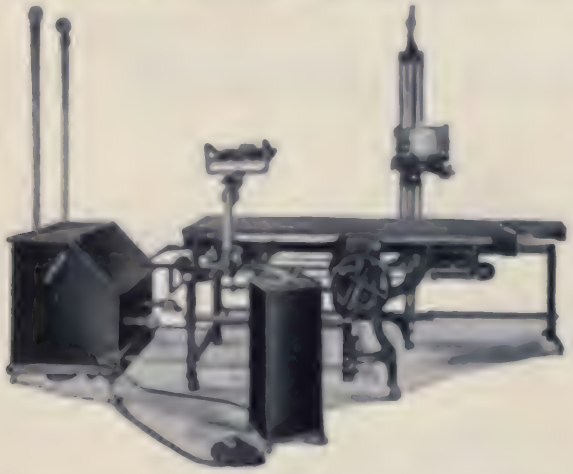
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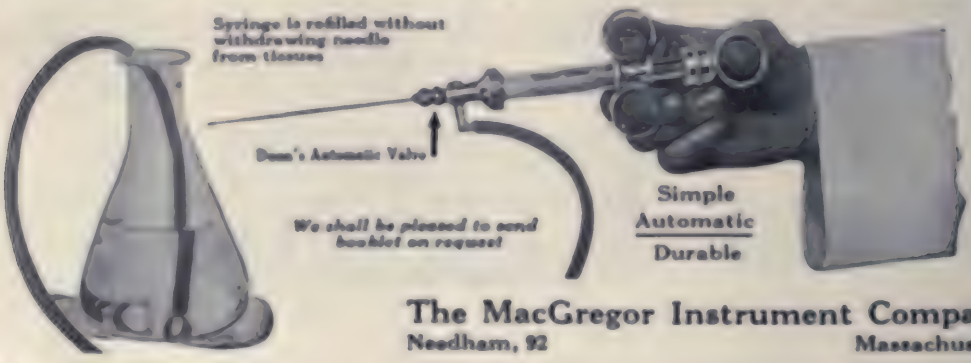
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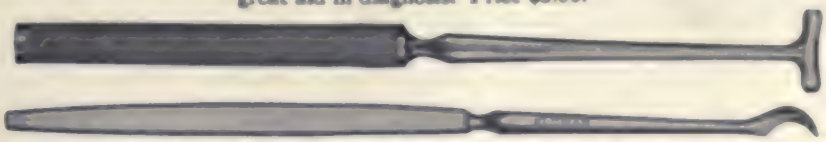
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It possesses a uniform hypochlorite strength (Na O Cl 4.05%) but, unlike other hypochlorite solutions, has remarkable keeping qualities. No testing is needed in making a Dakin Sol. It is merely diluted with water to desired strength.

Hyclorite does not inhibit leukocytosis and phagocytosis. It has a rapid solvent action on necrotic tissue, produces lymph flow and promotes prompt healing.

Hyclorite is used full strength or diluted to suit the case. In proper dilution, Hyclorite is isotonic. Effective in dilutions as high as 1-2000, it is very economical, and is efficient in all conditions where the use of a hypochlorite antiseptic is indicated.

Accepted by the A. M. A. Council on Pharmacy and Chemistry (N. N. R.)

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